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DEPARTMENT OF THE ARMY FIELD MANUAL

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INFANTRY DIVISION

SIGNAL BATTALION

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HEADQUARTERS, DEPARTMENT OF THE ARMY

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FIELD MANUAL

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HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D. C., 7 June 1961

INFANTRY DIVISION, SIGNAL BATTALION

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CHAPTER 1

GENERAL

1. Purpose and Scope

This manual is a guide for the employment of personnel and the utilization of equipment in an infantry division, signal battalion.

a. This manual contains information relative to the mission, organization, administration, logistics, and tactical employment of a signal battalion as equipped under TOE 11-5(). It presents essential guidelines which, coupled with experience, judgment, and foresight, enable the battalion commander, the company commanders, and other key personnel of the infantry division, signal battalion, to select courses of action which will insure effective communications-electronics, signal logistic, and signal photographic support to the infantry division.

b. The material presented herein is applicable without modification to both nuclear and nonnuclear warfare.

c. Communications-electronics as referred to in this manual is defined as: The management and systematic employment of devices and techniques designed to acquire or transmit information essential to the command control of friendly military forces, and to counteract the effectiveness of similar operations conducted by the enemy.

d. Users of this manual are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which change is recommended. Reasons should be provided for each comment to insure understanding and complete evaluation. Comments should be forwarded direct to Commandant, US Army Signal School, Fort Monmouth, N. J.

2. References

Publications and other reference materials pertaining to the subjects within the scope of this manual are listed in appendix I.

3. Mission

The mission of the Infantry Division, Signal Battalion, is to:

a. Provide signal communications, to include communications to subordinate units, for the:

- (1) Division headquarters and headquarters company, exclusive of staff vehicle radio sets.
- (2) Division trains headquarters and the headquarters and headquarters detachment, infantry division trains and infantry division band, exclusive of staff vehicle radios.
- (3) Division administration center and the infantry division administration company, exclusive of staff vehicle radios.
- (4) Brigade headquarters, exclusive of staff vehicle radio sets.

b. Establish and operate a division area communication system of signal centers, wire and radio trunk and local lines, and radio/wire integration stations to provide general and direct communications support for units in the division area.

c. Operate the division area ground messenger service.

d. Perform photography (except aerial photography) for the division, and still picture laboratory service for all divisional units.

e. Provide signal supply and field maintenance of signal equipment for the division.

f. Fight as infantrymen when required.

CHAPTER 2

ORGANIZATION

Section I. SIGNAL BATTALION

4. General

The infantry division, signal battalion, is organic to the infantry division. The signal battalion participates as part of the combined arms team, providing command communications for the division. The signal battalion is capable of defending its installations against hostile ground attack, each individual of the battalion is trained to fight as an infantryman. These latter capabilities, however, may be limited by factors of extended dispersion of battalion elements, mobility of the tactical elements and the urgency of requirements for communications support.

5. Components

The infantry division, signal battalion (fig. 1) consists of a headquarters and headquarters company, a command operations company referred to as company A, and a forward communications company referred to as company B.

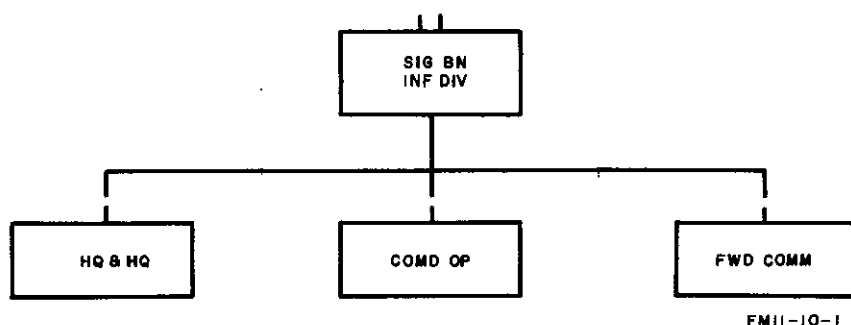


Figure 1. Organization of infantry division, signal battalion.

Section II. HEADQUARTERS AND HEADQUARTERS COMPANY

6. Mission

The mission of the headquarters and headquarters company is to:

- a. Direct and coordinate operations and training of the bat-

tation, and to provide the headquarters facilities with which the battalion commander exercises control.

b. Provide the division signal officer (DSO) and his staff and staff facilities.

c. Provide consolidated personnel management and administration, and supplemental supply and maintenance support for the battalion.

d. Perform field cable construction, and provide an augmentation of radio relay terminal and repeater stations and telephone carrier terminals for the battalion.

e. Perform photography (except aerial photography) for the division, and photographic still picture laboratory service for all divisional units.

f. Provide signal supply and field maintenance of signal equipment for the division.

g. Fight as infantrymen when required.

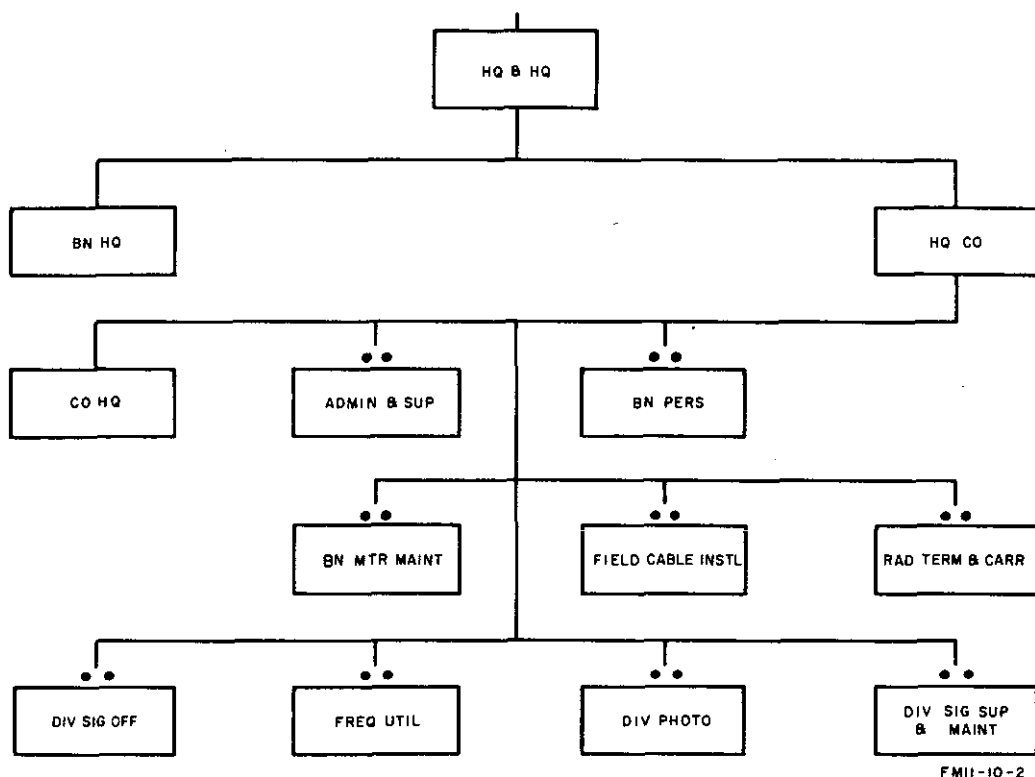
7. Components

Headquarters and Headquarters Company (fig. 2) is organized into a battalion headquarters and a headquarters company.

a. *Battalion Headquarters.* The battalion headquarters includes the battalion commanding officer (who is also the DSO) and supervises the employment of the personnel and operation of the equipment of the companies organic to the signal battalion.

b. *Headquarters Company.* This company contains the personnel and equipment to operate the battalion staff sections and the photographic section; to provide the division signal supply and maintenance and motor maintenance capability and to augment certain communication capabilities. Each section is described below:

- (1) *Company headquarters.* The company headquarters directs and coordinates the administrative and logistical support for the company, battalion headquarters, and the division signal office.
- (2) *Administration and supply section.* This section contains the enlisted personnel and the equipment necessary to:
 - (a) Support the Battalion Staff Administration and Intelligence Operations.
 - (b) Provide supply support (except Signal repair parts) for all elements of the battalion. This element operates under the supervision of the battalion S-4 and pre-



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Figure 2. Organization of headquarters and headquarters company, infantry division, signal battalion.

pares requisitions and supply reports, and receives, processes, stores, and delivers supplies as required.

- (3) *Battalion personnel section.* This section provides a personnel warrant officer and the enlisted personnel and equipment necessary to provide a battalion consolidated personnel section. This section operates under the supervision of the S1/adjutant. All personnel records and reports required by higher headquarters are maintained or prepared in the section. Information upon which these records and reports are based is obtained from the companies on an informal or abbreviated basis. The section is normally located in the division administrative center at the division rear echelon, with personnel sections from all other divisional units.

- (4) *Battalion motor maintenance section.* This section op-

erates under the supervision of the battalion motor officer. It provides motor maintenance for headquarters and headquarters company, and armament maintenance and supplemental second echelon motor maintenance for the operating companies of the battalion. It also provides the ordnance and engine generator repair parts for the battalion. The maintenance section personnel prepare and submit through the battalion S-4 requisitions for repair parts and maintain organizational maintenance records and files.

- (5) *Field cable installation section.* This section installs, maintains, and recovers field cable in the division area, and assists the operating companies of the battalion, as required, in the installation and recovery of field wire and multiconductor cable. The section is organized to operate in three eight-man teams. The section operates according to the battalion standing operating procedure (SOP) and mission-type orders issued verbally or in writing, as authorized by the division signal officer. The section will be employed as needed to assist the wire teams of the battalion's operating companies with initial installation. When the division wire/cable installation requirement is beyond the capabilities of the battalion wire teams, assistance may be requested from corps. The battalion SOP should specify the use of this section in detail, including a clear delineation of the staff section, sections or officer under which it will operate when not specifically attached to companies. This will assure a minimum of day-to-day orders and allow the section to plan and prepare for its employment.
- (6) *Radio terminal and carrier section.* This section operates according to the battalion SOP and mission-type orders in the same manner as the field cable section. It provides a pool of radio relay repeater and terminal stations and telephone carrier terminals for use in the division area as required to supplement capabilities organic to battalion operating companies. Although a total of five radio relay terminal and repeater stations and four separate carrier terminals have been included in the table of organization and equipment (TOE), personnel have been provided for operation of only four stations (three men per station). It is improbable that the need for additional stations will exceed four at any one time. A greater capacity may be achieved by reduced manning, by reinforcement from the operating companies to which

attached, or by co-location of two stations, which once installed can be operated by a single crew.

- (7) *Division signal officer's section.* This section provides the officer and enlisted staff and the equipment for the division signal officer's staff. For detailed information on the staff, see chapter 7.
- (8) *Frequency utilization section.* This section operates according to the battalion SOP and mission-type orders in the same manner as the field cable installation and the radio terminal and carrier sections. Direction-finding sets are employed to determine general location and nature of communication and electronics interference, as reported by divisional units. Corrective action or recommendations to the commanding general for appropriate corrective action are initiated by the DSO, depending on the nature of the interference. The frequency utilization section also assists the cavalry squadron and the aviation company in locating or confirming the location of targets at which electronic radiating devices are used.
- (9) *Division signal supply and maintenance section.* This section provides the officer and enlisted staff and the equipment to support the signal battalion's signal logistics mission to provide signal supply and field maintenance of signal equipment for the division. For details of the employment and operation of this activity, see chapter 4.
- (10) *Division photographic section.* This section provides the officer and enlisted personnel and the equipment to support the battalion's photographic mission. For information on the employment of the photographic section refer to chapter 5 and FM 11-40.

Section III. COMMAND OPERATIONS COMPANY

8. Mission

The mission of the command operations company is to:

a. Provide signal communications for the echelons of division headquarters, the brigade headquarters, the division trains headquarters, the division administration center, and the division fire support coordination center (FSCC).

b. Provide signal communications (except internal radio nets) for the division headquarters and headquarters company, the headquarters and headquarters company detachment, infantry division trains and infantry division band, exclusive of staff vehicle radios.

c. Provide area signal center support to units located in the vicinity of the division headquarters echelons and in the division rear area, supplemental to organic facilities.

d. Establish and operate an assigned portion of the division area communication system.

e. Establish and operate facilities to connect division artillery headquarters into the division area communication system.

f. Provide and operate net control and other stations as required in division and higher echelon radio nets, to include division and army air request nets and a division warning net.

g. Fight as infantrymen when required.

9. Components

The command operations company (fig. 3) is organized into a company headquarters, rear echelon operations platoon, trains area operations platoon, brigade headquarters operations platoon, two command signal center platoon headquarters and a message center section, a telephone section, a radio section, a radio terminal and carrier section, an installation section, and an air support signal team.

a. *Company Headquarters.* Company headquarters provides command control and coordination of the company operations. It also provides mess facilities and second echelon motor maintenance for the company.

b. *Rear Echelon Operations Platoon.* This platoon establishes and operates a signal center at the division rear echelon. It provides communications for that echelon, for the administration company, and for the administrative center. Radio relay, carrier and patching facilities are not provided in the platoon. Field wire or field cable is considered adequate for connection to the nearest army area signal center, or a division signal center if the rear echelon is located in the division area.

(1) *Platoon headquarters.* Platoon headquarters provides command control and coordination of platoon operations. The platoon leader serves as signal officer for the division rear echelon, administrative center, and administration company.

(2) *Message center section.* This section provides communications center facilities for the division rear echelon on a 24-hour basis. This includes message center, cryptographic, teletypewriter, and limited motor messenger service. It also operates the rear echelon signal center

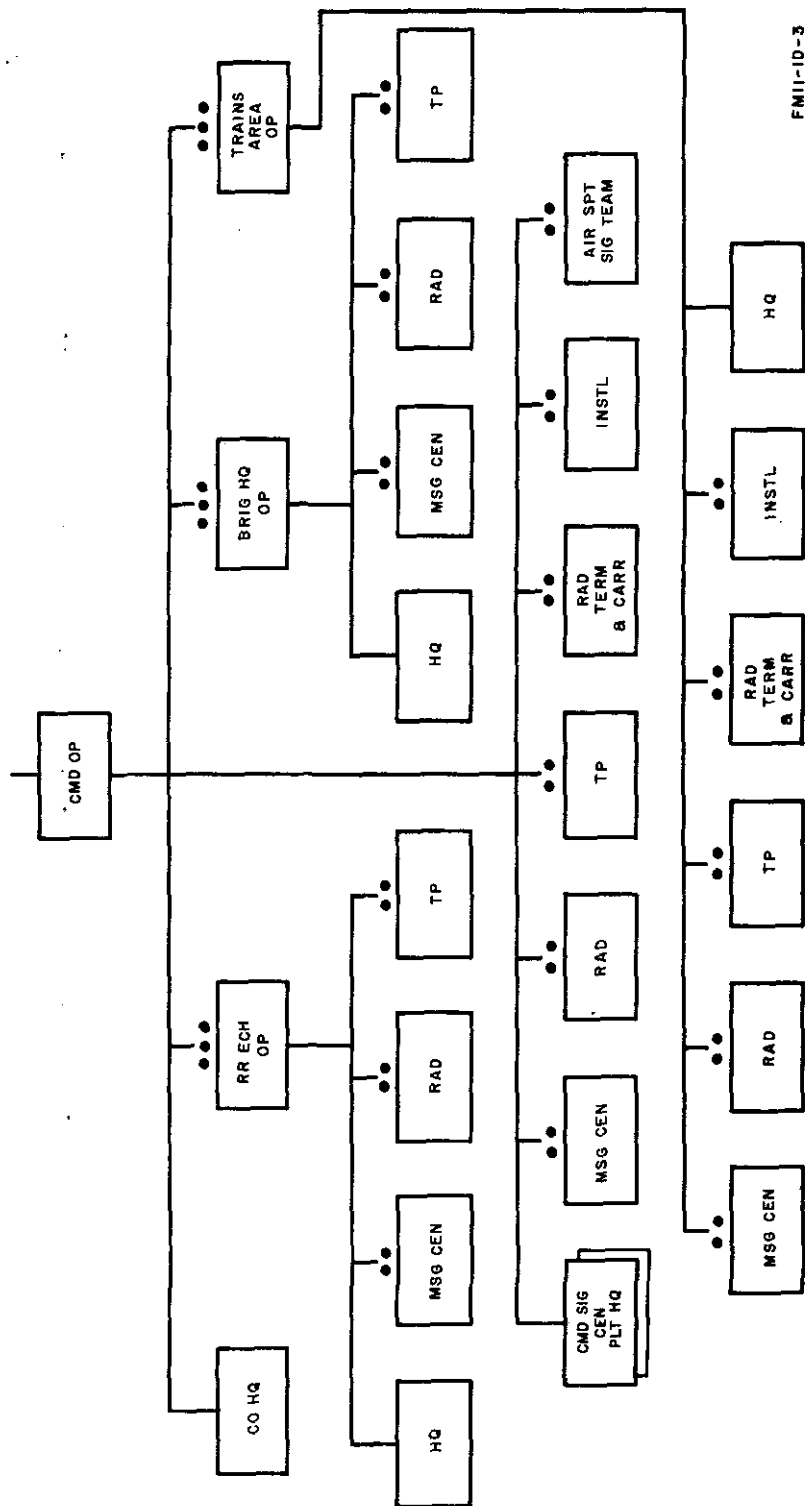


Figure 3. Organization of command operations company, infantry division, signal battalion.

radio receiving station in the division, or army warning net. The message center section is designed to operate in one echelon only.

- (3) *Telephone section.* This section is organized to install the telephone system and to install and operate a single-position manual telephone switchboard on a 24-hour basis for the division rear echelon, administrative center, and the administration company. The section is equipped with a second switchboard for use during periods of overload or for displacement.
- (4) *Radio section.* This section operates a radio-teletype-writer set in the division administrative/logistical net.

c. *Trains Area Operations Platoon.* This platoon establishes and operates a signal center at the division trains headquarters. It provides communications for that headquarters and the trains headquarters detachment.

- (1) *Platoon headquarters.* Platoon headquarters provides command control and coordination of platoon operations. The platoon leader functions as signal officer for the trains headquarters and maintains close coordination with the communications officers and commanders of the units served by the platoon.
- (2) *Message center section.* This section provides communications center facilities, including message center, cryptographic, teletypewriter, and limited local area messenger service on a 24-hour basis for the division trains headquarters and for units in the division trains area (supplementary to the organic capabilities of these units). The section operates the trains area signal center radio receiving station in the division warning net. The section is manned and equipped to operate in one echelon only.
- (3) *Telephone section.* This section operates a single-position manual telephone switchboard in the trains area signal center. The switchboard provides telephone service for the trains headquarters and for units in the division trains area. It also provides trunk switching service in the division area communication system. A second switchboard is authorized for displacement and utility purposes. The section performs the communications control function in the trains area signal center, to include patching and termination of trunk lines, circuit testing, and maintenance. To carry out this mission, the tele-

phone section is authorized communications patching panels and circuit control operators.

- (4) *Radio section.* This section operates a radio-teletype-writer set in the division administrative and logistics net. It also operates the trains area signal center radio/wire integration station and a station, either in the trains net or division CG/command net as required.
- (5) *Radio terminal and carrier section.* This section installs and operates the trains area signal center terminals of the radio relay system and associated carrier equipment in the division area communication system. The section is manned and equipped to operate radio relay terminal sets.
- (6) *Installation section.* This section consists of two four-man wire installation teams. The teams install and maintain the wire system for trains headquarters, and the field wire links from the trains area signal center to units in the area. Each team is equipped with a $\frac{3}{4}$ -ton truck and wire-laying equipment. A trailer is also provided each team for transporting a small basic load of field wire and cable.

d. *Brigade Headquarters Operations Platoon.* This platoon establishes and operates a signal center at brigade headquarters.

- (1) *Platoon headquarters.* Platoon headquarters provide command control and coordination of platoon operations. The platoon leader functions as signal officer for brigade headquarters and maintains close coordination with the communications officers and commanders of the units in the area served by the platoon.
- (2) *Message center section.* This section provides communications center facilities for brigade headquarters and for units in the area on a 24-hour basis. This includes message center, cryptographic, teletypewriter, and limited local area messenger service, which is supplemental to the organic capabilities of the units in the area. The section operates the brigade signal center radio receiver station in the division warning net. The message center section operates in one echelon only.
- (3) *Radio section.* This section operates a radio-teletype-writer set in the division command/operations net. It also operates the brigade signal center radio/wire integration station, and an FM station in the CG/command net. The SB-22 switchboard for the radio/wire integra-

tion station can be found in the telephone section of the command operations company.

- (4) *Telephone section.* This section operates a single-position manual telephone switchboard on a 24-hour basis. A second single-position switchboard is provided for displacement. The section contains two three-man wire teams equipped with a $\frac{3}{4}$ -ton truck and trailer with wire-laying equipment.

e. Command Signal Center Platoons. Two command signal center platoon headquarters and teams from the separate sections are organized into functional groups as needed to establish and operate a signal center at division main, and establish and operate a division advance signal center. The command signal center platoon headquarters are employed as the supervisory elements for the division main and advance signal centers. Each platoon leader is provided with a vehicular radio set for operation in the signal battalion internal radio net. This radio may also be used as a relay station in the division CG/command net as required.

f. Message Center Section. This section provides communications center facilities, including message center, cryptographic, and teletypewriter service and motor messenger service, on a 24-hour basis, for the division main and advance signal centers, and supplements the organic capability of units located in the vicinity of these echelons. The section is equipped and manned to operate two mobile centers. Each center consists of a mobile teletypewriter and cryptographic operation group, and a shelter for use as a combined message center and facsimile terminal at one echelon and a message center at the other, since only sufficient facsimile for operation at one echelon is provided. The division signal messenger service is operated by the message center section. Air messenger service is normally employed between dispersed signal centers. Aircraft are provided from the division aviation company based on priorities established by the division commander. Motor messengers are provided to support units in the vicinity of signal centers, and to supplement aviation messengers when conditions prohibit the use of aircraft. Normally, motor messengers operate in pairs (one as driver and one as guard) on all message runs. If the tactical situation dictates, messenger capability may be expanded by providing guards and vehicles from other sources.

g. Telephone Section. This section operates the telephone central offices at the division main and advance signal centers. It is capable of operating two mobile, two-position switchboards simultaneously on a 24-hour basis. Portable switchboards are authorized for alternate operations as required. Normally, the two-

position switchboards will be located at the division main and advance signal centers. The telephone section also performs the circuit control function in the signal centers at which located, to include patching and termination of trunk lines, and circuit testing. To carry out this mission, the telephone section is authorized three circuit control operators and two truck-mounted communications patching panels.

h. Radio Section. This section operates the net control stations (NCS's) in division headquarters radio nets and subordinate stations at the echelons of division headquarters (other than rear). It also operates the radio/wire integration stations at division main and advance signal centers. The SB-22 switchboard for this purpose can be found in the telephone section (*g* above). The section is manned and equipped to operate the following sets simultaneously on a full-time basis:

- (1) Three high-power tactical radio-teletypewriter stations (one equipped with ground-to-air radio equipment).
- (2) Four medium-power tactical radio-teletypewriter stations (two equipped with FM radio sets).
- (3) Two medium-power tactical voice/continuous-wave (cw) radio sets (both equipped with one FM vehicular radio set capable of providing retransmission, and one High-Frequency (HF) Receiver).

i. Radio Terminal and Carrier Section. This section installs and operates the terminals of the radio relay system and associated carrier equipment at division main command post signal center, the advance signal center, (when established), division artillery headquarters and brigade headquarters.

j. Installation Section. The installation section installs interconnecting cable between signal center components, wire and cable in division echelon command post (CP) areas, and wire locals to other units in the vicinity of division echelon signal centers.

- (1) The section is organized and equipped to make up two four-man field wire teams, each equipped with a $\frac{3}{4}$ -ton truck and wire-laying equipment. Each team carries a small basic load of wire and cable in the trailer provided.
- (2) During the period of installing interconnecting cable between signal center components, the field wire teams of the installation section will require assistance from personnel in other sections of the company. Installation teams from headquarters and headquarters company, augmented, if necessary, from other elements of the battalion, will be required to assist these installation sec-

tions field wire teams in situations beyond their capabilities.

k. Air Support Signal Team. The air support signal team provides communications at the division FSCC. It installs and operates the telephone switchboard at the fire support coordination center (FSCC), provides message center and cryptographic facilities, operates the NCS in the division air request net, and operates the division radio station in the army air request net. It also operates a uhf receiver in the spot report receiver system for monitoring uhf-equipped tactical air support aircraft operating in the division area. This radio equipment accompanies the G3 air to the division FSCC. An FM radio is provided for monitoring and/or entry into such command or fire nets of the division as may be necessary.

Section IV. FORWARD COMMUNICATIONS COMPANY

10. Mission

The mission of the Forward Communications Company is to:

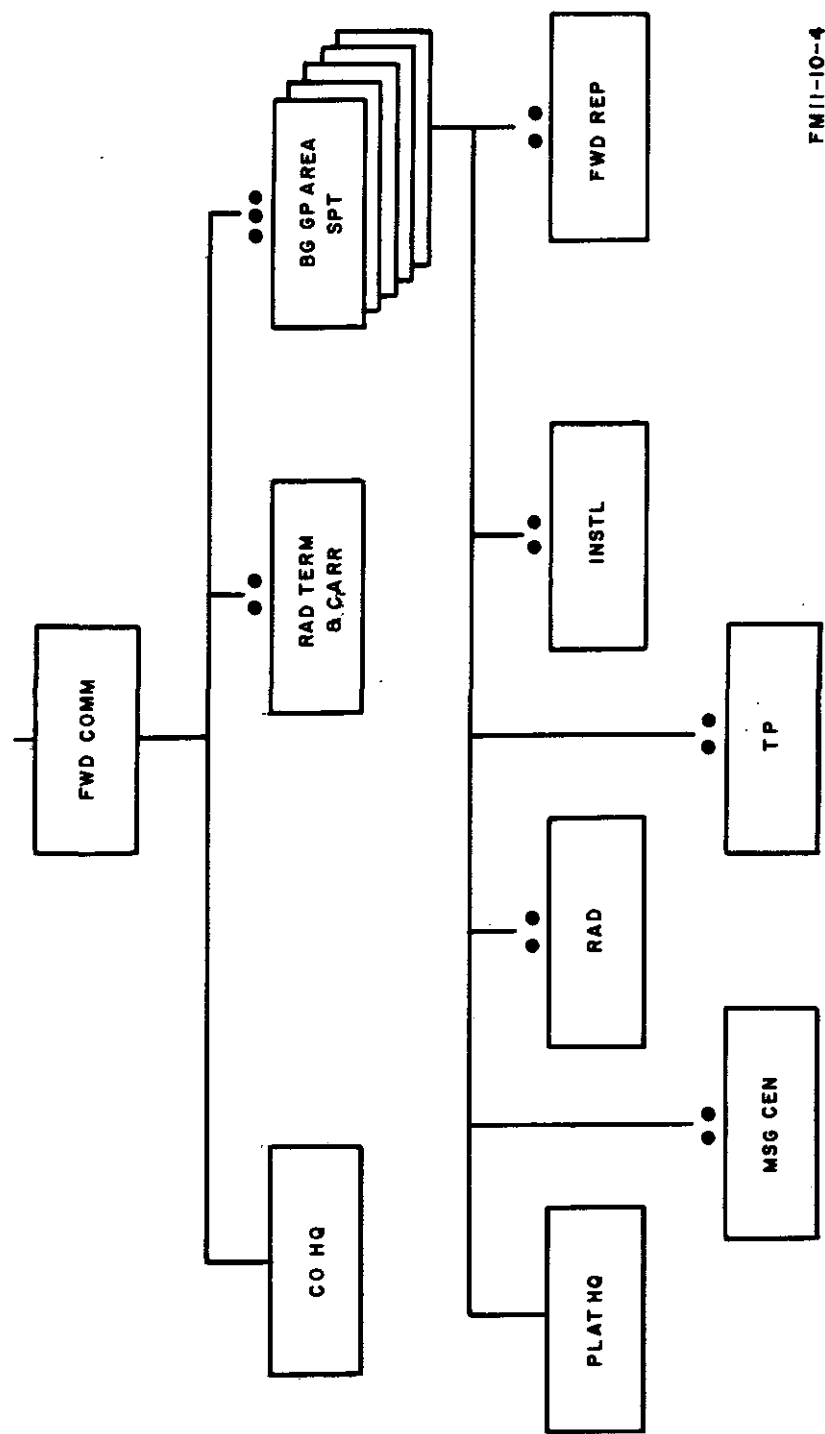
- a. Provide direct and general support signal center support to units in the division forward area, supplemental to organic capabilities.
- b. Establish and operate an assigned portion of the division area communication system.
- c. Connect battle group headquarters and other units in the area into the division area communication system.
- d. Provide signal field maintenance support for units in the division forward area to the maximum extent possible.
- e. Fight as infantrymen when required.

11. Components

The forward communications company (fig. 4) is organized into a company headquarters, a radio terminal and carrier section, and five battle group area support platoons.

a. Company Headquarters. Company headquarters provide control and coordination of the company. It also provides mess facilities and second echelon motor maintenance for the forward communications company.

b. Radio Terminal and Carrier Section. This section provides the personnel and equipment to operate mobile multichannel radio terminal sets. The sets are used to establish the forward terminals in the division area communication system. The section is also



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Figure 4. Organization of forward communications company, infantry division, signal battalion.

equipped with portable switchboards for establishing forward switches or terminating points on extension links from forward signal centers. The terminal sets normally will be positioned as close to the patching panel as is consistent with security and dispersion, to facilitate cable/wire laying to terminal sets. If feasible, terminals should be collocated to enable a minimum of personnel to operate efficiently and to reduce the number of wire routes to be installed and maintained.

c. Battle Group Area Support Platoon. These platoons are organized along functional lines. Each is normally associated with, but not controlled by, a particular battle group. These platoons are normally given the task of direct support of a battle group and general support of other units in the vicinity. Each support platoon has a platoon headquarters and five operating sections:

- (1) *Platoon headquarters.* The platoon headquarters provides control and coordination of platoon operations and limited organizational maintenance of platoon power units. The platoon leaders maintain close coordination with the communication officers and commanders of the units they support.
- (2) *Message center sections.* These sections provide communication center facilities, including message center, cryptographic, and teletypewriter service for units and unit elements located in the signal centers area of responsibility. This service is supplemental to the organic capability of the supported units. The sections are not manned or equipped to provide messenger service. Supported units will pick up and deliver their messages as required. Each section contains a radio receiver with which it monitors the division warning net. One mobile teletypewriter central office is provided to furnish three teletypewriter terminals, two with cryptographic facilities at each center. The sections are manned and equipped to operate in one echelon only.
- (3) *Telephone sections.* These sections operate a mobile manual telephone central office. Each section is equipped with two manual telephone central offices; the sections are manned on the basis that only one central office will be in operation in each section at one time, with the other being used for displacement or for establishing a forward switch for limited periods as required. The telephone central office equipment will handle both the local and trunk line switching requirements placed on the center. The telephone sections are also responsible for the communications control functions in their respective signal

centers, to include patching and termination of trunk lines, circuit testing, and maintenance. For this purpose, two communications patching panels are provided. Each panel is mounted in a trailer—one in operation, the second for displacement or for establishing a forward switch.

- (4) *Radio sections.* These sections operate FM radio sets using remote control equipment as radio/wire integration stations. Each radio section operates two FM radio sets, one set in the infantry band of frequencies and the other set in the artillery band. The SB-22 switchboards required for this purpose can be obtained from the radio terminal and carrier section of the forward communications company.
- (5) *Installation sections.* These sections are organized as five-man wire teams. Each team is equipped with one $\frac{3}{4}$ -ton truck and a trailer.
 - (a) Each section installs interconnecting cable for components of a forward signal center and is responsible for wire laying, maintenance, and furnishing telephone instruments to supported units as required. Some of the units which may require this assistance are:
 1. Platoons of the forward support company of the division ordnance battalion and company headquarters.
 2. Elements of the ambulance and clearing companies of the division medical battalion and the headquarters of companies if located in the division forward area.
 3. Collection and evaluation section of the collection and evaluation platoon of the division quartermaster company.
 4. Forward distribution points, if established by the division quartermaster company.
 5. Truck and/or carrier squads of the division transportation battalion if located in the forward area.
 6. Traffic control points (TCP's), if established in the forward area by the division military police detachment.
 7. General support platoon groups and associated landing fields established in the division forward area by the division aviation company.
 8. Companies or company elements of the division engineer battalion headquarters if so located.
 - (b) Since these sections have many responsibilities and a limited number of personnel and equipment with which to perform their missions, priority should be estab-

lished for connecting units into the system. Priorities will depend on the immediate situation and should be coordinated fully with the battle group staff. An SOP should also be established to dictate the number of circuits each unit will receive initially and the necessary augmentation at a later date if time and equipment permit.

- (6) *Forward repair sections.* These sections provide supplemental organizational and field maintenance of signal equipment for the platoons, and field signal maintenance for other elements of the division. Each section is equipped with a mobile shop. For further details, see chapter 4.

CHAPTER 3

DIVISION AREA COMMUNICATION SYSTEM

12. General

To fulfill the requirements of modern warfare and to meet the needs of the foreseeable future warfare, the division area communication system was developed. The division area communication system provides :

- a.* Communications service to widely dispersed units.
- b.* Flexibility to meet changes in division task organization and, at the same time, facilitate relocation of units, command posts, and installations.
- c.* Patching facilities to permit the electrical rerouting and physical relocation of circuits with a minimum of system changes.
- d.* Facilities for transmission of classified information.
- e.* Reliability of signal communications.
- f.* Common-user circuits to provide communications for installations and units that would otherwise require more extensive organic systems.
- g.* Sole-user and through trunk circuits for coordination in the employment of weapons systems and for other special operations.
- h.* High-capacity potential to meet the demands likely to be placed upon it.
- i.* High-quality communication system capable of operating at extended distances.
- j.* Integration with the communication systems of corps and field army.

13. Responsibility

Responsibility for establishing communication is a command responsibility. The division commander normally delegates this responsibility to his staff signal officer. The division signal officer operates in a dual capacity, as the staff signal officer and the commanding officer of the division signal battalion. The division signal battalion provides the division with the necessary personnel and equipment to establish the division area communication system.

14. Composition

The division area communication system consists of:

- a. Command signal centers and forward signal centers established by the division signal battalion and linked together by multi-channel, multi-axis communication facilities.
- b. A signal messenger service linking the echelons of division headquarters with the division major subordinate commands.
- c. AM and FM point-to-point internal radio communications nets.
- d. Radio/wire integration stations capable of linking mobile FM radio stations with the telephone system at command and forward signal centers.

15. Employment

a. *General.* The many variations of the operational environment in which the division signal battalion provides support to the division prevent a fixed employment of personnel and equipment authorized by TOE or a fixed pattern of operation. The system will vary in configuration, size, and composition, according to the following factors:

- (1) Division mission and organization for combat.
- (2) Location and disposition of the division units.
- (3) Characteristics of the division area of operations.
- (4) Enemy capabilities.
- (5) Attachment of forces by higher headquarters.

b. *Multichannel Systems.* Two types of applications of the multichannel communication systems employed in the division area communication system are illustrated in figures 5 and 6. It would be a rare case if either of the methods shown were completely suitable to support a particular infantry division mission. They will, however, provide the DSO and his staff with a basis on which to build a system tailored to support the division mission.

c. *Flexibility.* The use of radio relay facilities and AM and FM radio nets facilitates the establishment of multichannel and single channel communications between the division headquarters and its echelons and its subordinate units over extended distances. This provides the signal centers operated by the division with alternate routes of adequate capacity, minimizes the system's vulnerability, and provides flexibility in employment of the division area communication system.

Figure 5. Type Infantry division multichannel communication system (Type I).

(Located in the back of manual)

Figure 6. *Type infantry division multichannel communication system (Type II).*

(Located in the back of manual)

d. Trunk Lines. The trunk lines in the division area communication system provide a means of communication from the echelons of division headquarters to immediate subordinate elements and between these elements. They also provide a means of communication for the use of other divisional elements in lieu of, or to supplement, the organic communications of these elements on a common-user or sole-user basis as required.

e. Common- and Sole-User Circuits. The division area communication system is comprised mainly of common-user circuits. To meet special requirements, sole-user circuits may be provided. For maximum utilization of the area communication system, sole user circuits should be held to a minimum. Sole-user circuits are those that are allocated for full-time use to provide point-to-point communication. Sole-user circuits are provided on a basis of traffic volume or traffic precedence. In the first instance, traffic volume must be great enough to keep the circuit continuously in use; that is, the circuit must be required so much of the time that it would be impracticable to attempt further use of the circuit for other purposes. In the second instance, the tactical urgency of certain types of traffic warrant sole-user service, as in fire direction, air traffic regulation and identification and air request circuits where even short delays cannot be tolerated.

16. Signal Centers

A signal center is a groupment of signal communications facilities installed, operated and maintained by Signal Corps units. A signal center provides communications center, messenger service, telephone and teletypewriter switching, and circuit testing and re-routing facilities. Other facilities, such as facsimile and automatic data processing, may be provided when authorized. The two types of signal centers used in the infantry division are as follows:

a. Command Signal Centers. The command signal centers are established by the command signal operations company of the division signal battalion. They provide signal center support for all echelons of division headquarters and for the brigade headquarters. In addition, these command signal centers provide signal support to units located in the immediate vicinity, supplemental to the units' organic capability.

b. Forward Signal Centers. Forward (area) signal centers are established by the forward communications company of the divi-

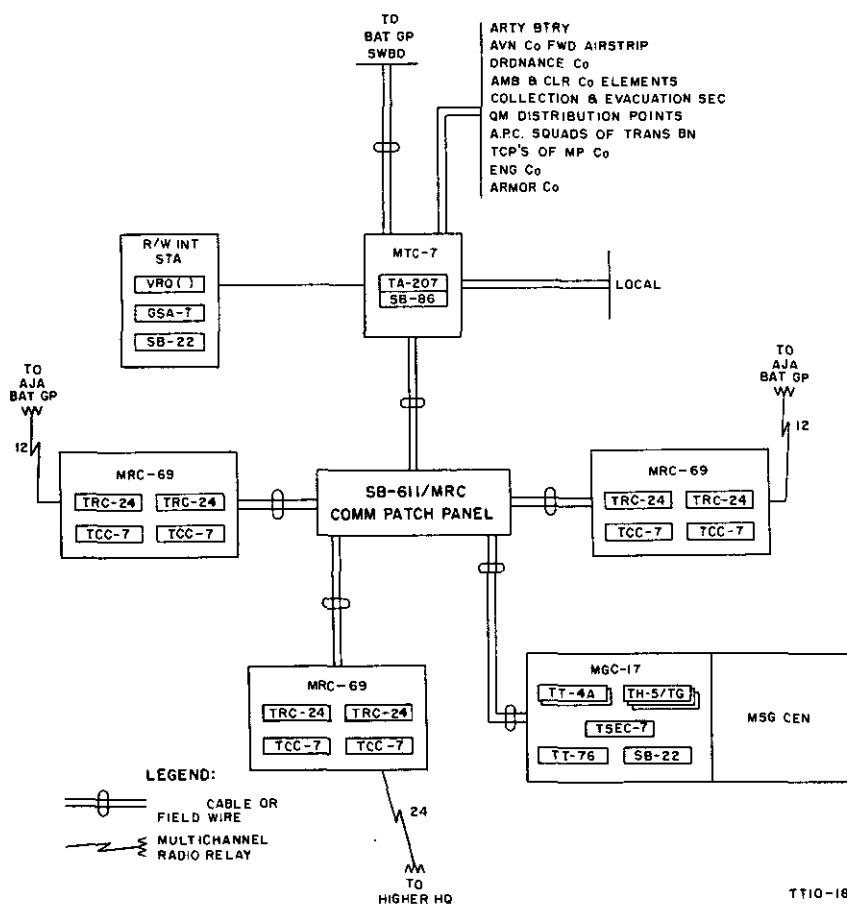


Figure 7. Type Forward Signal Center, block diagram.

sion signal battalion. Primarily, forward signal centers will be located to tie the battle groups into the division area communication system; at the same time, they will provide signal center support to units within their assigned geographical area of responsibility (fig. 7).

17. Radio Relay

a. Radio relay is the primary means for trunk lines communication in the division area communication system. It is also the primary means for telephone service between the major headquarters in the division. Individual companies of the signal battalion are assigned areas of responsibility for installing terminals in the system.

- (1) The command operations company installs terminals for the main and advance signal centers and for brigade headquarters, division trains headquarters and division artillery headquarters.
- (2) The forward communications company installs the terminals at the five forward area signal centers.
- (3) Headquarters company maintains a pool of terminal and repeater equipment for installation and/or augmentation as needed in the system.

b. A type employment of the radio relay and wire carrier capability of the battalion is shown in figures 5 and 6.

c. Division terminal equipment and operating personnel for the radio relay circuits in the corps/army communications systems are provided by corps/army units.

18. Division Radio Nets

a. *General.* Radio nets of division headquarters and divisional units are primarily for internal organizational communication between major divisional units. Other radio equipment is provided for air warning systems and communication with echelons above division.

- (1) In some situations, such as emergencies or during movement, radio communications can be used to supplement a segment of the multichannel links connecting signal centers.
- (2) FM and AM radios normally are used to establish initial communication between headquarters, particularly when other means, such as wire or radio relay, are unavailable or unsuitable. As other means become available, radio stations operating in nets, that can adequately be covered by other means, should revert to standby or listening silence.
- (3) A typical arrangement of nets in which radio stations operate for division headquarters is shown in figure 8.

Figure 8. Typical infantry division radio nets.

(Located in the back of manual)

- (4) Although radio nets are designated functionally (command, intelligence, etc.), traffic and other considerations will frequently dictate that the nets be combined and used for more than one type of traffic.

b. Internal Radio Nets. The division's internal radio nets are described below:

- (1) *Division CG/command net fm-voice.* This net provides a direct channel of communication between the division commander and the commanders of all units operating directly under division control. The use of this net is restricted because of its large number of stations, but staff officers and subordinate unit commanders may monitor or operate in it if necessary. In addition, liaison officers of the division, when operating with adjacent or higher headquarters, may operate in this net to facilitate close coordination between units. The division signal battalion furnishes on a full-time operating basis, the net control station at division main. The signal battalion is equipped to establish relay stations in the net, either with the radio sets provided for this purpose or with the radio/wire integration station facilities. Airborne relay stations, when required, are established by coordination with the division aviation company. Other headquarters represented by stations in this net are division advance, brigade, division artillery, each of the five battle groups, the armor battalion, cavalry squadron, signal battalion, military police detachment, aviation company, division trains, engineer battalion, ordnance battalion, medical battalion, transportation battalion, quartermaster company, and attached units directly under division control.
- (2) *Division command/operations net.* This net is used for the operational command and control of the division. The NCS is located at division main headquarters. The NCS and its operating personnel are furnished by the signal battalion. Other stations normally operating in the command/operations net are brigade headquarters, division advance, division artillery, division aviation commander, engineer battalion, each of the five battle groups, armor battalion, and the cavalry squadron. Division trains may enter the net as required by switching set from another net.
- (3) *Division intelligence net.* This net is used for transmission of information and intelligence of the enemy. The NCS is located at division main and serves primarily as a means of communication for G2 message traffic. It may also pass command or logistical message traffic, if the command or logistical nets are either inoperative or overloaded. Other stations normally operating in the in-

telligence net are division advance, division artillery, each of the five battle groups, cavalry squadron and aviation company.

- (4) *Division administrative/logistics net.* This net is used for transmission of administrative and logistical message traffic. The NCS is located at division main and serves primarily as a means of communication for G1 and G4 message traffic. The NCS and its operating personnel are furnished by the signal battalion. Other stations normally operating in the administrative/logistics net are division rear, division artillery, each of the five battle groups, armor battalion, cavalry squadron, aviation company, division trains, engineer battalion, ordnance battalion, medical battalion, transportation battalion, and quartermaster company.
- (5) *Division air-request net.* This net is used to forward request for immediate tactical air support directly to the division FSCC and for disseminating information and instructions to units on all types of airstrikes that may affect the command. The NCS is operated by personnel of the signal battalion at the division FSCC, where it is located with G3/air. Other stations in the net are the five battle groups, the armor battalion, and cavalry squadron. The radio sets used in this net have secondary roles, such as the transmission of information in the division warning/broadcast net.
- (6) *Division warning/broadcast net.* This net is used to broadcast air alerts, chemical, biological, and radiological warfare (CBR) attack warning, fallout warning, rad-safe-data*, nuclear strike warnings, and similar information of an urgent operational nature. This information is required by all divisional units, and the requirement for timeliness prohibits handling through command channels. The NCS operates at division main with personnel and equipment furnished by the signal battalion. Radio receiving sets are provided throughout the division for monitoring this net. Each battalion and separate company, and, in some instances, subordinate elements of these units, are equipped with a radio receiver to monitor broadcasts over this net. Certain organizations may switch radio equipment from other nets to transmit in this net. These are division advance, each of the five battle groups, the armor battalion, and cavalry squadron. Division artillery usually broadcasts all air alerts; the

* Data transmitted relative to the amount of radioactivity in a specified area.

cavalry squadron usually broadcasts urgent reconnaissance information of immediate interest to elements of the division.

c. *External Radio Nets.* The external radio nets in which the infantry division is a transmitting station are described below:

- (1) *Corps command net.* This net is used by the corps commander for the command and operational control of his major subordinate units. The division station, which is furnished by the division signal battalion, operates in conjunction with the signal center at the division main command post. The station employs AM radio-teletype-writer equipment that is additionally capable of operating on voice or cw.
- (2) *Army logistics net.* The division signal battalion also furnishes the radio-teletypewriter station that operates in this net. The net is used for administrative and logistical traffic between the division and army headquarters. The equipment used in this net is also used, as required, in a secondary role to support the displacement of other radio-teletypewriter stations in the division. Since other means of communication with logistical support agencies are normally available, this station is used to a great extent in its secondary role. Location of the radio set operating in the Army Logistical net depends upon the mode of logistical operation adopted by the supported infantry division. In some divisions the situation may dictate location of the set at the division trains headquarters, while in others the set may operate in the vicinity of the ACofS G4, at division headquarters.
- (3) *Army air-request net.* This net is used to obtain air support for the division. A radio set is used in this net to provide communication between the division G2 Air and G3 Air at the division fire support coordination center (FSCC) and the field army tactical operations center (FATOC). The radio set is also furnished by the division signal battalion.
- (4) *Spot report receiver system, uhf-voice.* The signal battalion is equipped to operate a uhf-voice radio station in the spot report receiver system for monitoring Air Force close support missions flown for the division. The station is mounted in the same vehicle as the division station in the army air-request net. The station may be used to monitor Air Force reconnaissance missions flown for

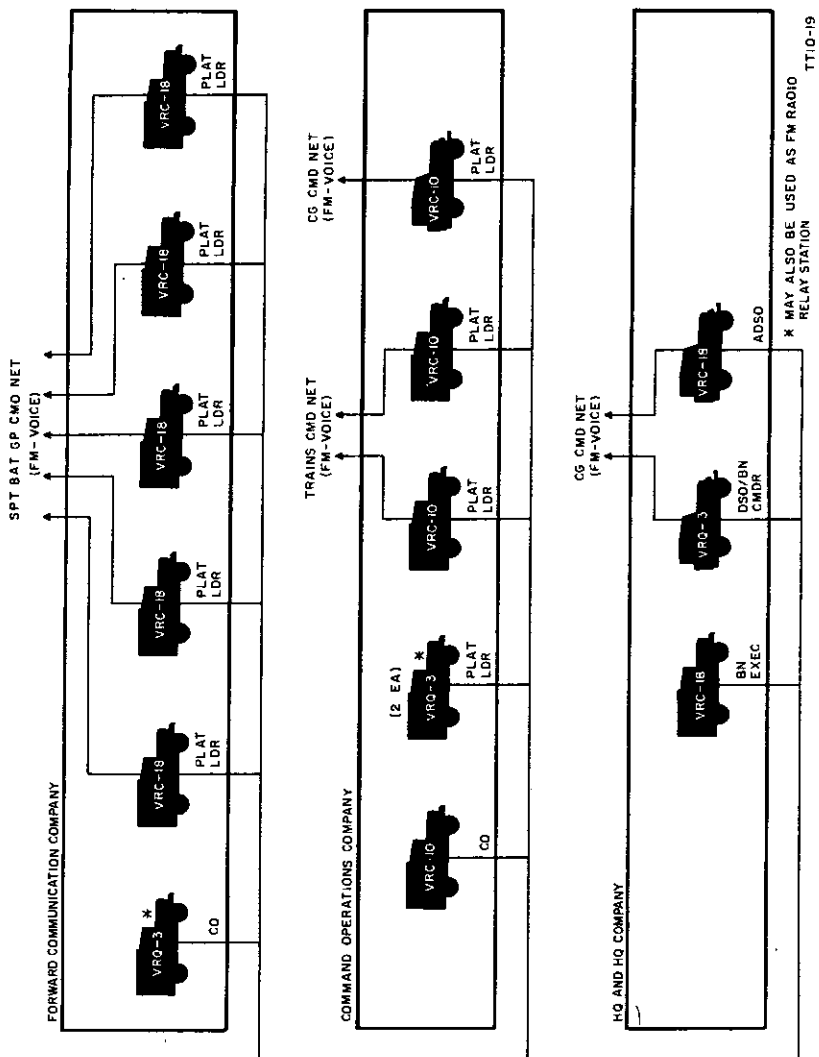
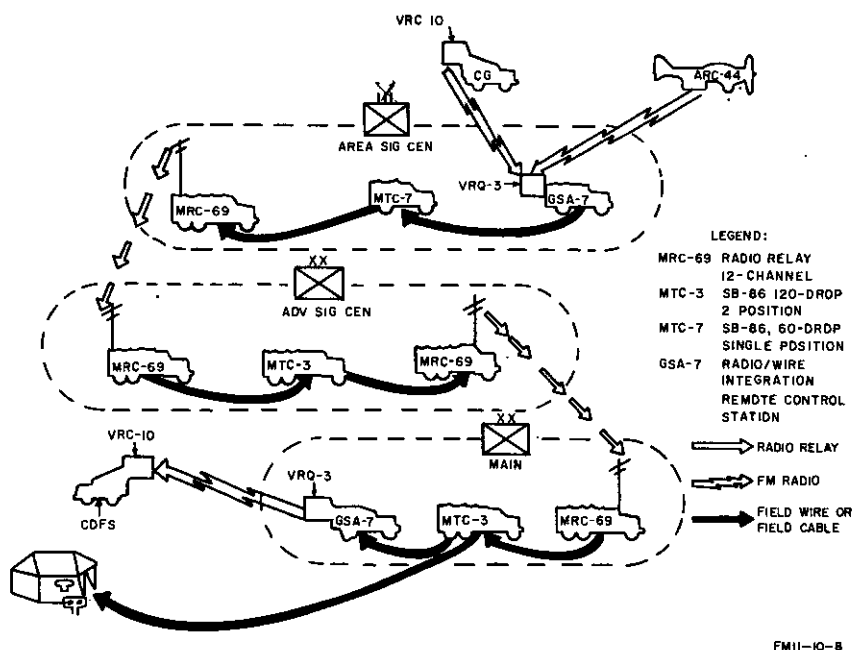


Figure 9. Signal battalion internal radio net.



FM11-10-8

Figure 10. Type utilization of radio/wire integration, infantry division.

the division. A separate set for G2 is provided in the division headquarters TOE for this purpose.

d. *Signal Battalion Internal Radio Net.* The primary purpose of the net is to enable the Bn Co/DSO to maintain direct contact with all elements of the signal battalion (fig. 9).

19. FM Radio/Wire Integration

a. Radio/wire integration stations (fig. 10) form an important part of the division area communication system.

b. At division level, an FM-voice radio/wire integration station is operated at each signal center (except at division rear) to connect FM radio stations into the division area communication system on a push-to-talk basis. The interconnection between the radio set at a division radio/wire integration station and an area communication system switchboard is made through a remote control unit and an SB-22/PT switchboard in the integration station vehicle. The operation of radio wire integration systems is standardized throughout the division by SOP's for radio operators, radio/wire integration station operators, and switchboard operators; it is standardized for users by division standing signal in-

structions (SSI). The signal operation instructions (SOI) refer to controls, such as radio station call signs and telephone directory names. The radio wire integration system is provided to the commanding general, division staff, and other designated key personnel in the division to contact division elements connected to the division area communication system. Whenever circumstances dictate it may also be used:

- (1) To establish emergency communication between mobile FM radio stations and elements connected to the division area telephone system by telephone.
- (2) To establish communication between FM radio stations separated by distances that are beyond the direct operating range of their FM radio sets.
- (3) For initial establishment (until wire links can be installed) of telephone service from the division area communication system to using units.
- (4) For voice communication between mobile combat elements in the division forward area and supporting division logistic elements in the rear area.
- (5) For communications between low-flying army aircraft operating in distant parts of the division area and airstrips of flight control elements connected to the division area communication system, when direct FM radio contact cannot be maintained.
- (6) For communication between forward air controllers and the air liaison officers' communication facilities, normally at the division FSOC, when these facilities are connected with the division area communication system.
- (7) To keep commanders and staffs in contact with subordinate and higher headquarters, as required, during the displacement of command posts.
- (8) To connect two switchboards and to span a break in a wire line between units.
- (9) For communication in river crossings.

20. Signal Messenger Service

The division signal messenger service is also an important part of the division area communication system. It consists of scheduled and special messenger motor and air runs. The motor messenger teams are organic to the division signal battalion. The air messenger service is provided by the division aviation company. Messenger service is normally provided from higher headquarters to subordinate units. However, special messengers may be dis-

patched from lower to higher echelons when the situation warrants. Special messengers are reserved for delivery of high precedence message traffic. Due to the limited number of messenger teams available the battalion SOP should clearly indicate those situations in which special messengers will be used. Whenever the tactical situation permits, messengers operating the division signal messenger service make deliveries directly to the headquarters message centers of the battle groups and to other major divisional elements, as well as to forward signal centers operated by the signal battalion. The forward signal centers serve only as messenger pickup and delivery points for the miscellaneous divisional unit elements in their respective areas. The division signal messenger service is normally provided by motor messengers operating in pairs for optimum security and by aviators provided by the division aviation company. If additional messenger service is required, messengers may be required to operate separately, provided additional motor vehicles can be obtained. In this case, miscellaneous personnel should be assigned to each messenger as a security guard.

CHAPTER 4

SIGNAL SUPPLY AND MAINTENANCE

Section I. GENERAL

21. Mission

The mission of the infantry division, signal battalion, with respect to signal supply and maintenance, is as follows:

- a. To furnish signal supply support to the infantry division.
- b. To furnish field maintenance of signal equipment to the infantry division.

22. Responsibilities

Responsibilities for the supply and maintenance mission are discharged by the supply and maintenance section of headquarters and headquarters company, and the forward repair sections of the battle group area support platoons of the forward communications company.

a. The supply and maintenance section of headquarters and headquarters company, composed of supply and maintenance personnel, has primary responsibility for supporting divisional units and organizations.

- (1) The supply unit supports the division for all signal supply, to include the following:

- (a) Maintains all supply records necessary for operation, such as quantity, demand data location, due-out, and due-in.
- (b) Receives, stores, and issues supplies.
- (c) Submits stock status reports and recommendations for changes of authorized stockage list as required.

- (2) The maintenance unit will furnish the mobile third echelon maintenance required by divisional units, and support the forward repair sections as required.

b. The forward repair sections furnish mobile third echelon maintenance and signal repair parts support to all units within the battle group areas.

c. Responsibilities are also assigned to appropriate personnel for the following areas:

- (1) Command maintenance inspection teams.
- (2) Technical assistance.
- (3) Training of unit personnel.
- (4) Liaison.

Section II. ORGANIZATION AND OPERATION

23. Supply Operations

a. General. The ideal supply system would be one capable of furnishing any item demanded by supported units, in any amount they need, whenever and wherever they need it. This would require a stock of unlimited quantities of all items authorized for issue, and a large force to receive stock, and issue them. Sufficient personnel and shipping space to keep such a system operating would not be available in modern warfare. The division supply system is, therefore, based on the principle of stockage of only fast-moving items. Slower moving items are requisitioned only as required and are kept in the communications zone or the rear of the field army service area. Items rendered excess will be returned to the communications zone or disposed of through appropriate channels (particular attention will be paid to special procedures peculiar to disposition of communication security or radioactive items). The quantity of each item stocked at direct support level is in accordance with AR 711-16 and AR 711-25.

b. Army Field Stock Control System. This system will govern division signal supply operations.

- (1) *Composition.* The Army Field Stock Control System standardizes the distribution of signal repair parts throughout the army and is composed of three basic elements.

- (a) *Selected stockage plan.* This plan encompasses the selection of those repair parts which must be stocked in each supply category in order to give the greatest maintenance return within the limitations and capabilities of the corresponding maintenance echelon.
- (b) *Stock records.* This element of stock control is essential to insure that the operating control of accounting will be performed accurately, reliably, and efficiently. Emphasis has been placed on the stock control function, because it is the key to any effective supply operation. Stock records must be simple, uniform, effective, easily operated and managed, and must insure that a perpetual inventory of supplies is available. This inventory

must be based upon demands, thereby eliminating stocks of inactive or unneeded items.

- (c) *Demand data.* The stock control system provides a simple method of gathering basic demand data as a byproduct of the individual stock control operation at the supply activity. It also provides for the computation of valuable, reliable demand rates.
- (2) *Parts-maintenance relationship.* A relatively small percentage of the total parts comprising a piece of equipment accounts for a large percentage of the maintenance requirements for the equipment. Once this parts-maintenance relationship is known, the problem becomes one of concentrating on supplying these active parts. The active, high demand parts list will vary from situation to situation as a result of such factors as climate, terrain, the enemy situation and intensity of combat operations. The unpredictable failures inherent in electronic equipment will often result in a skewed pattern of demands.
- (3) *Stock records.*
 - (a) Stock records were developed as an integral part of the field stock control system to furnish supply personnel with an efficient, uniform, effective, perpetual inventory of parts, based on the recurring demands for these parts, and placing emphasis on the stock control function. The basic stock record consists of the stock accounting record, title insert, demand data card, and due-in and due-out cards for an individual item. It incorporates such additional features as:
 - 1. Preprinting of item identification for accuracy, speed and uniformity of changes in item identification.
 - 2. Visible margining, indexing, and signaling of individual item status for ease of control.
 - 3. Grouping of all stock control information on one form to simplify and standardize computation of levels and for determination of requirements or excesses.
 - (b) The stock records for each item are filed in one visibly indexed pocket. These pockets are filed in slides of stock record cabinets.
 - (c) By glancing at a tray of stock records, the supply status of a group of items can be seen in graphic form. The sliding signals reflect relationships between balance on hand and control level. Excesses are signaled by sliding the signal completely to the right; in zero balances, signals are moved to the left. Active dues-out and emergency dues-in are signaled with colored inserts.

(4) *Determination of requisitioning objectives.*

- (a) The most important element of stock control is the determination of realistic requisitioning objectives. Prior to submission of replenishment requisitions, commanders will review and analyze stock records to determine the propriety of established requisition levels and direct upward or downward revision, as required.
 - (b) Recurring demand experience during the previous 90 days or a comparable period in the case of items demanded only during certain seasons, will be used as a basis for determination of average replacement factors and to reconstruct recurring demands. When a substitute has been issued in lieu of an authorized item, traffic on the substitute must be reflected in the total demand for the authorized item.
- (5) *Demand data.* Involved here is a simple, uniform, and effective method of accumulating, reporting, and analyzing demand data directly from the source. Furthermore, these data are available as a byproduct of the normal stock control function in an operating supply unit. Entered on the demand data card are two of the three basic factors required to compute a realistic demand rate: the actual recurring demands for an item; and the period of time over which these demands were made. Demands are annotated on these cards at the end of each requisitioning period. When these cards are completed, they are returned in accordance with the schedule to the agency prescribed in AR 711-16. The third basic factor, the density of signal equipment supported, must be obtained from other sources of information and submitted with the completed set of demand data cards.
- (6) *Demand rates.* National procurement and distribution of repair parts is dependent on the rate at which these items are required throughout the world. Initial procurement and distribution of repair parts for a new item is estimated, based on demand data and parts mortality of similar items. In addition, a factor is included for the supply pipeline to assure continuity of supply. It is universally recognized that once a new signal item has been used in the field for a period of time, the parts demand rate may differ considerably from the estimated mortality rates. To determine these changing replenishment repair parts demand rates so that procurement and distribution may be more closely and rapidly geared to

actual field requirements has long been a problem. Automatic resupply will be instated during tactical operations wherever feasible. Under the army field stock control system, the data are gathered from the point closest to the source of the demand. These demand data are forwarded as prescribed in AR 711-16.

c. Importance of Supervision and Training. In standardizing the distribution system for signal repair parts throughout the army, the army field stock control system plays an effective part in furthering the objective of the field army signal distribution system. Every effort will be made to maintain a high state of training among personnel employed in the system. Experience has shown that the system, designed as it is to accomplish a great number of operations speedily, will also reproduce any errors just as rapidly. The army field stock control system is a tool of management. Its efficient use will help assure good supply service to using units.

d. Request Flow.

- (1) Request for all signal supplies other than repair parts will be submitted by organizations directly to the signal supply and maintenance point.
- (2) The request will normally be formal, on a request for issue or turn-in form, or in the format of such form if teletypewriter is used as a communication means.
- (3) Requests for repair parts, from organizations other than battle groups, will be submitted directly to the supply and maintenance point, in the same manner as for non-repair parts.
- (4) Requests for repair parts from the battle groups will be submitted by the battle group to the supporting forward repair section. This establishes the maintenance channel as the source of repair parts supply for battle group elements.
- (5) The forward repair sections submit requests for repair parts directly to the division signal supply and maintenance point. These requests include third echelon repair parts for use by the forward repair sections, and organizational repair parts distributed by the forward repair sections to the battle group.
- (6) Requests for repair parts from the battle group communications platoons and the forward repair sections may be either formal or informal. The method used should include provisions for informal brief records con-

taining necessary information on spare parts. The minimum information would be that pertaining to a stockage list and demand data. If practicable, these records may be maintained at the supply and maintenance point, to relieve the forward repair sections of administrative details.

- (7) Since the supply and maintenance point will stock primarily fast-moving repair parts, requests for supplies must be handled by different methods for stocked (normally stocked by supply and maintenance point due to demand) and nonstocked (not usually stocked by supply and maintenance point due to lack of demand) items.
 - (a) A request for a stocked item which is on hand will be filled immediately under established procedures.
 - (b) A request for a stocked item which is not in stock will require establishment of a due-out. Although an immediate request will not normally be forwarded to the next higher supply echelon since the item should be on order, at the time an item is placed on due-out, it will first be matched against open due-in requisitions, to assure that the item is in fact on order and in sufficient quantity. The request would then be filled upon arrival of the replenishment supply at the supply and maintenance point due to lack of demand) items.
 - (c) A request for a nonstocked (fringe) item will be forwarded immediately to the next higher supply agency, without consolidation. The requisition will specify that shipment be addressed to the using organization. Shipment will be made directly to the using organization or through the signal supply and maintenance point whichever is appropriate. The requisition will also specify that for direct-to-user shipments, a copy of the shipping document will be furnished to the signal supply and maintenance point. A due-out will be established and follow up effected as appropriate to assure proper supply action.
- (8) Direct exchange of signal items will be utilized in accordance with applicable regulations.

24. Maintenance Operations

a. General. The maintenance support to organizations in the division is third echelon mobile maintenance. Repair by replacement through the use of maintenance float, is the normal method of support. Third echelon maintenance will include replacement of individual parts, alinement, adjustment, testing and inspection.

b. *Signal Maintenance Float.* The signal maintenance float (not applicable when in CONUS garrison) in possession of the forward repair sections is actually the property of the supply and maintenance point and is carried on the supply and maintenance point records as being allocated to the forward repair section. Such allocation is based upon the demand or need of the organization(s) being supported by the forward repair section. The total signal maintenance float authorized the division signal supply and maintenance point is initially a figure equal to 3 percent of the major signal end items authorized the infantry division or a quantity of 30, whichever is smaller. A larger maintenance float may be established if authorized by the division G4. The division signal supply officer (DSSO) normally will retain part of this quantity at the supply and maintenance point and allocate quantities to the forward repair sections. The maintenance float in support of avionics equipment is established at 20 percent of the major items supported. The maintenance float in support of radiac equipment is established at 25 percent of the signal items supported. In each instance Signal Corps approval will be obtained for the establishment of floats for regulated items or items in short supply.

c. *Operation of Forward Repair Section.*

- (1) The forward repair section, as an organic element of the battle group area support platoon, operates in the battle group area. Its mission of support extends to all units located in the battle group area, and includes third echelon maintenance support and supply of signal repair parts for organizational maintenance.
- (2) Second echelon maintenance support of the battle group area support platoon is performed for the signal battalion by the forward repair section. Time and distance factors render this support by the other battalion elements impracticable, if not impossible.
- (3) During normal operation, the forward repair section will replace unserviceable equipment with serviceable items from maintenance float. As time, circumstances, and capability permit, these unserviceable items will be repaired and returned to the section's maintenance float. The items of maintenance float carried by the section may consist of end items, assemblies, subassemblies, or major components of end items.
- (4) Unserviceable equipment which cannot be repaired by the forward repair section will be evacuated to the supply and maintenance point.

- (5) Items of maintenance float that have been utilized in normal operations, and that cannot be replaced by repair of unserviceable equipment, will be replaced by the supply and maintenance point upon request and in accordance with local SOP.

d. Operation of Supply and Maintenance Point.

- (1) The supply and maintenance point will normally be centrally located with respect to troop units it supports. This point has maintenance float used to support the concept of repair by replacement.
- (2) Maintenance personnel in headquarters and headquarters company are not assigned to teams by TOE; they are assigned only to the supply and maintenance section. This situation permits complete flexibility in the use of personnel to accomplish specific tasks. Teams may be tailored to include any desired or required skills needed for the accomplishment of a maintenance mission.
- (3) For units having a fully mobile capability two different methods are available for effecting signal maintenance operations. Each of the two methods has its advantages and disadvantages. The selection of the method to be employed by each unit can only be made after carefully weighing all factors pertinent to each situation.
 - (a) Signal equipment requiring maintenance may be brought to the signal supply and maintenance point. Conducting maintenance operations at this point enables production line methods and procedures to be employed even though on a limited scale. Direct supervision of operations by better qualified signal maintenance personnel, is also possible when this method is used.
 - (b) On-site maintenance methods may be employed where radar sets, switchboards, or other heavy or semi-fixed items of equipment are involved, making their movement to the maintenance point impractical. In this method, the advantage of mobility and flexibility are utilized to the maximum extent.
- (4) Special maintenance problems exist within the division which are most readily solved by the attachment of signal maintenance personnel or teams to other units requiring their services. Attachment of signal maintenance personnel to other units has the disadvantage of reducing control and supervision. Precautions must be taken to avoid misuse of these signal maintenance personnel on

detached service and their assignment to duties other than signal equipment repair.

- (a) Four repairmen, whose primary skill deals with aviation electronic equipment, (avionics), are presently assigned to the supply and maintenance section. For maximum utilization of their capability, these four repairmen should be organized into an avionics team located with the division aviation company at the division base airfield together with avionics maintenance float equipments. This arrangement offers maximum working time on equipment, the elimination of transportation for unserviceable equipment, and in some instances, the maintenance of equipment without removal from the aircraft.
- (b) Location of personnel with installations, such as the ordnance maintenance point, is also desirable. Vehicle deadline time can be minimized when vehicle and signal repair are performed concurrently. Since most track laying vehicles and many wheeled vehicles have radio equipment installed, a signal repair team attached to the ordnance point offers considerable economy of operation.
- (c) Cryptographic repairmen will be attached to the signal centers and a photographic repairman will be attached to the photo section as required.

e. Inspections.

- (1) The inspections with which the signal battalion will become involved include spot check inspections, organizational (command) inspections, command maintenance inspections, and signal technical inspections. The signal battalion will perform technical inspections on signal materiel, and will be required to provide personnel for the conduct of signal spot check and command maintenance inspections in divisional units. The DSO is responsible to the division commander for the conduct of command maintenance and spot check inspections of signal equipment organic to units of the division, and normally delegates scheduling and coordinating to the DSSO.
- (2) The basic documents authorizing and prescribing inspections of signal supplies and equipment are AR 750-5, AR 750-8, AR 750-610, and AR 750-625. These regulations also list the forms and reports to be used, specify the frequency and scope of inspections, and give

information relative to the determination of deficiencies and the methods of rating inspections. The SB 11-100 series prescribes the serviceability standards to be used in conducting inspections of signal materiel in the hands of a using organization. Detailed technical information regarding the inspections of any particular item is contained in pertinent technical publications for the item.

- (3) The inspection workload is borne by the division signal supply and maintenance section, because it provides personnel for the conduct of signal inspections throughout the division. Technical inspections, as noted above, denote the initial and final inspections performed on an item of materiel prior to its entry into a maintenance shop, and after repairs have been made in the shop. Technical inspections are performed by the division signal supply and maintenance section and forward repair section as part of their normal maintenance functions.
- (4) While the division commander delegates responsibility to the signal officer for command maintenance and spot check inspections, preventive maintenance inspections remain the responsibility of the unit commanders.

CHAPTER 5

DIVISION SIGNAL PHOTOGRAPHIC SUPPORT

25. General

Division signal photographic services are provided by the photographic section of headquarters and headquarters company. These services include still and motion picture photography (except aerial photography) for the division, and air and ground still photographic laboratory service for all divisional units. The primary mission of the photographic section is to perform tactical ground photography. It will also be required to support division information officer (IO) activities. Aerial photography may be performed by the photographic section's use of ground-type cameras when aerial cameras are not essential or available. This mission, however, normally will be performed by U.S. Army Aviation or Air Force aircraft, properly equipped with air-type cameras.

26. Mobile Photographic Laboratories

Two mobile photographic laboratories are provided for the processing of still pictures. These laboratories will be employed to process coverage by photographers of the photographic section, aerial photographic coverage by the division aviation company, and coverage by other photographers operating in the division area. One of these laboratories will normally be located at a designated division airstrip, and the other will usually be located at the signal battalion CP.

27. Processing Motion Picture Film

The photographic section is equipped to record but not process motion pictures. The processing of motion picture film is performed at theater army level. The division photographic section is not equipped to process U.S. Air Force aerial photography utilized by the division.

28. Color Photography

Color photography may be performed by the photographic section when materials are available. Exposed color film will be sent to the nearest color processing facility.

CHAPTER 6

TACTICAL APPLICATION OF SIGNAL BATTALION'S
COMMUNICATION CAPABILITY

29. Communication in Concentration Area

a. General. A tactical concentration is the assembly of forces in a selected area from which impending operations can be launched. Effective control of the concentration depends on the prompt establishment of the command post and signal communication.

b. Planning Communication for Concentration. During the preparation for the concentration, the division signal officer and his staff—

- (1) Conduct a reconnaissance of the concentration area to obtain detailed information concerning the location of command post sites, messenger routes, and all existing military and civilian signal facilities.
- (2) Prepare a signal plan for communication during the movement of the division into the concentration area.
- (3) Coordinate the installation of all signal systems within the concentration area. This insures an integrated system for the division as a whole.
- (4) Provide communication security during the movement into, and occupation of, the concentration area.

c. Communication Activities During Concentration. During the concentration, the signal officer and all personnel of the division signal battalion are engaged in training and in performing signal supply and other signal activities. The extent to which these activities are carried on depends on the state of training, the adequacy of equipment, the number and capabilities of personnel and other factors peculiar to the contemplated operation. The more important signal activities include—

- (1) Revising the SOP or preparing a new one to meet the requirements of anticipated operations.
- (2) Training personnel in the installation, operation, and maintenance of new or special equipment provided for the operation. This includes training in modified or new operating techniques.

- (3) Studying enemy characteristics and adopting special precautions required by the planned operation to insure the successful performance of missions.
- (4) Formulating specific communication security measures for the anticipated operation. These are in addition to all normal security measures.
- (5) Insuring technical inspection of all signal equipment in the division to determine its operating condition and adequacy.
- (6) Replenishing shortages and replacing unserviceable items.
- (7) Establishing and maintaining a signal supply point for the division.
- (8) Installing, operating and maintaining the division area communication system.
- (9) Preparing SOI and SSI.
- (10) Making a detailed reconnaissance for the purpose of establishing an area communication system capable of meeting foreseeable future requirements.
- (11) Drafting tentative plans for future operations and making preliminary provisions for their execution.

d. Application of Communication. Signal communication normally is required from the command post in the concentration area to landing zones and debarking, detraining, and detrucking points; division security and reconnaissance forces; division trains and rear echelons; the headquarters of division units; and division supply and evacuation installations within the area.

- (1) *Communication centers.* Communication centers are operated at each echelon of division headquarters, and others may be located at sites such as entraining and detraining points.
- (2) *Messengers.* Messengers are employed at each established communication center. The signal officer determines whether the volume of message traffic and the location of communication centers serving the division and its element warrant the establishment of scheduled messenger service.
- (3) *Radio communication.* Radios in the concentration area are silenced when secrecy and surprise are essential to the success of the concentration, except as needed to broadcast warnings and as needed by reconnaissance forces in contact with the enemy.
- (4) *Wire communication.* The installation of wire in a con-

centration area should be limited, but should suffice for concentration operations and provide for future use of the area.

- (5) *Radio relay.* Radio relay teams are deployed, but remain on listening silence to ensure secrecy during the concentration. As soon as the tactical situation permits, listening silence will be lifted.

30. Communication During Marches and Halts

a. General. Marches by an infantry division may be made in one or more stages, in one or more columns, and on one or more routes. They may be motor marches or combined foot and motor marches. In either case, minimum essential communication must be provided for control of the moving columns. The signal officer is given information of the march plan in time for the signal battalion to provide the required communication facilities.

b. Communication While Columns Are Forming. While units are moving to their march positions, communication from the division command post to unit command posts may be maintained by radio and special messengers. Radio can be used advantageously for communication between staff officers supervising the organization of march columns, especially when the different units are widely separated. However, the use of radio is subject to security restrictions.

c. Communication During Marches. Communication is provided from division main to reconnaissance and security elements operating under division control to column commanders, to command posts of the other echelons of division headquarters, and to control points. Communication within the various reconnaissance and security elements of any column is the responsibility of the column commander.

- (1) *Communication centers.* Communication centers are established at division main, trains, and rear echelon command posts, and at control points and advance locations designated in the march plan. When the division commander accompanies the division on the march, communication center operations are conducted in a vehicle moving with the march command post.
- (2) *Messengers.* The number of messengers and the type of service provided at each communication center varies with the size of the echelon served. Motor messengers are indispensable at the communication center of the march command post. At least one messenger vehicle is detailed to follow the division commander's vehicle.

Motor messengers also may be detailed to follow designated staff vehicles, the communication center vehicle, and the operating radio vehicles. When aircraft are available, air messenger service is used to supplement motor messenger service.

- (3) *Radio communication.* The employment of radio communication during the march is determined by such factors as security, the speed of movement, the importance of surprise, and the necessity for rapid communication. Frequently, radio is the only adequate means for communication between rapidly moving or distant units, and between air and ground elements. The division CG/ command net includes stations at division main, at the march command post of each column and on occasion, at control points and advance message centers. The division intelligence net includes stations at division main, with the reconnaissance and security elements under division control, and with elements of the aviation company observing for the division.
- (4) *Visual communication.* Panels, hand signals, and pyrotechnics, including colored smoke, are the principal means of visual communication used during the march. Friendly aircraft may warn marching troops of impending hostile attacks by flying over and alerting the columns with prearranged signals. Panels are used to mark specified vehicles in column and to transmit short prearranged messages. These panels are displayed by either message center or radio teams. A special prearranged pyrotechnic code may be prescribed for use on the march. If higher commanders have designated the code, the division requests authority to assign additional special meanings that are needed.
- (5) *Wire communication.* When control points or advance communication centers are located near existing wire circuits, arrangements are made to use the circuits. When columns march on roads that are paralleled by commercial wire lines, arrangements may be made to establish wire communication over such lines at specified times, such as during periodic halts.
- (6) *Radio relay.* Radio relay is utilized during a march whenever the dictates of security, surprise and speed of movement permit. Where the tactical situation does not permit multi-axis radio relay, a single axis along the division's axis of advance will be established. Maximum

use is made of commanding heights which permit installations of a base radio relay station, and continuous contact with the advancing units over long distances. Particular care is exercised to provide for the defense of such stations. Helicopter-movement of radio relay equipment is utilized wherever possible.

d. Communication During Extended Halts. Plans must be made in advance for the communication system to be used during a halt. Factors that are considered in formulating the plans include the location of communication installations and elements of the division signal battalion in the area, availability of indigenous communication facilities, the volume of traffic and types of communication required by the division commander for reconnaissance, security activities, and administration; and the conservation of signal supplies to insure the availability of sufficient quantities for the next operation.

- (1) *Communication centers.* The schedule for reliefs at communication centers is arranged to cover the time the command post is expected to remain in bivouac area.
- (2) *Messengers.* The signal officer determines whether special or scheduled messenger service, or both are to be provided. The duties of some messengers on the march are tiring, and the need for rest during the halt must be considered. Normally, special messenger service is adequate during halts. Local messengers are informed of the locations of the various offices at the command post and are given the names of the officers on duty at each site. During the halt, messengers must reconnoiter the routes from the communication center to the other installations in the vicinity.
- (3) *Radio communication.* Radio stations are located as near as practicable to the signal message center. The restrictions placed on the use of radio during a march usually are applicable during a halt. When security permits, the division intelligence net continues to operate. Stations in the command nets, although normally prohibited from transmitting, usually remain in a standby status (ready for operation). Radio operation in corps and army nets continues to be as directed by corps and army commanders.
- (4) *Visual communication.* When observation aviation is working with the division during a daylight halt, a panel station is established. The panel station, combined with a message drop and pickup point, is located so as to

preserve maximum security for the command post against observation by hostile aircraft.

- (5) *Wire communication.* The telephone system installed in the bivouac area is held to a minimum. When wire facilities already exist, arrangements may be made for their use to reduce the requirement for new telephone lines. When practicable, telephone communication trunks between signal centers are established by using radio relay in lieu of wire lines.
- (6) *Radio relay.* Where security aspects permit, radio relay systems are established during extended halts to interconnect all signal centers.

e. Signal Supply. Signal supplies, including expendable items for the march, are distributed before the march begins. When it is necessary to issue additional supplies during halts, the signal bivouac area usually is designated as the signal supply point.

31. Communication During Development

a. General. During development, columns break up into smaller groups and move on assigned march objectives, or move to assembly positions preliminary to deploying for attack or defense. The signal battalion must be prepared to meet the communication requirements created by the changing tactical situation.

b. Application of Communication. There is no break in the operation of the area communication system during development. A properly planned operation insures a communication system flexible enough to meet the requirements of development and deployment.

- (1) *Communication centers.* The march command post communication center may continue operation during development. If a communication center does not accompany the headquarters on the march, one must be established at the new command post by signal center personnel of the advance party.
- (2) *Messengers.* With units changing locations during development and with several of them possibly using the same routes, close coordination is required to permit the continuation of adequate messenger service. Units should notify the division communication center of the locations of their command posts, and all messengers should be instructed concerning the routes to, and the locations of, the units to which they are dispatched. Scheduled messengers make their deliveries to unit rear echelons or

old command post locations until new locations are established, at which time the messengers are rerouted to the unit command posts.

- (3) *Radio communication.* The extent to which radio is used depends on the requirements for secrecy and surprise as balanced against the urgency for radio communication. When security permits, the division command net is operated during the development. The operation of secondary stations in this net may be limited to combat units in contact with the enemy. Usually, there is no reason to curtail radio operation in the division intelligence net during the development. The commander needs this channel of communication to receive timely information concerning the enemy.
- (4) *Visual communication.* The use of visual communication during the development is governed by the enemy's ability to observe the visual signals. It may be necessary to curtail the use of visual communication if enemy air observation is active.
- (5) *Wire communication.* Every effort is made during the development to establish the wire system required for combat. The installation of lines that will not be used during combat is held to a minimum. When an installation section of the signal battalion's battle group support platoons has completed the installation of wire lines to a battle group, the section must maintain the lines, stand prepared to extend them when the battle group command post moves, and be prepared to aid battle group communication personnel on order of the division signal officer.
- (6) *Radio relay.* An extensive radio relay system is planned for use during a development, including extensions of the systems to support exploitations. Where, during early phases of the development, security dictates, radio relay listening silence will be imposed. Teams will be deployed for earliest possible use, and displacement equipments will be designated and held well forward to support tactical successes. Equipments and radio relay teams will be pre-designated and deployed for possible air-mobile operations.

32. Communication During Attacks

a. General. During an attack, combat troops of the division normally are organized into three tactical forces: the main attack

force, the secondary attack force, and the division reserve force. Since the main attack force requires the maximum of signal communication support, the division signal officer and division signal battalion personnel are particularly concerned with the location and direction of the main attack.

- (1) *Orders and instructions.* When time permits, the signal officer obtains approval of his plan for signal communication, completes the detailed signal plan, and issues orders to the signal battalion. However, the installation of the area communication system is not delayed to await the detailed signal plan. If any delay is contemplated, the signal officer orders the advance party to proceed to the designated location of the command post; there they install the communication system. Fragmentary orders and SOP's are used in the absence of other orders.
- (2) *Instructions to subordinate units.* The necessary instructions on signal matters are communicated to all units requiring them. These instructions may be issued at a conference of the division signal officer and the unit signal/communication officers, or they may be sent in messages or issued in the signal annex of the division operation order. These instructions may concern messenger service, use of radio, location of signal supply points, use of the wire system, and any other information of a coordinating nature. The division SOP tends to reduce the volume of such instructions.

b. Application of Communication. Time factors govern the extent to which the installation of signal communication facilities may be carried out. In addition, the elaborateness of the signal installation is limited by the quantities of signal supplies and equipments available to the division.

- (1) *Communication centers.* The operation of a communication center at a division command post may involve displacement from a temporary location (used during the development) to a more advanced location. Displacement is made by leapfrogging the teams of the communication center. The communication center must be prepared to displace on short notice.
- (2) *Messengers.* Normally, after the attack has been launched, special messengers are used forward of the division advance signal center.
- (3) *Radio communication.* When surprise is important, radio operation is limited initially to those units in contact with the enemy. In some instances, to increase deception and surprise, the operation of dummy stations

may be directed by higher commanders. When the division is moving into an area just prior to attack, it maintains listening silence until the attack is launched. When the division already is occupying a sector from which it is to launch an attack, and its radio stations are already in operation, normal radio operation is continued without substantial change in traffic load until the attack is launched. If the division is moved to another sector or relieved by another unit, it may be required to provide dummy stations to remain in the area and continue normal operation until the attack is fully under way. Once the attack is launched, the special restrictions on radio operations are, as a rule, removed.

- (4) *Wire communication.* The initial wire system installed for the attack is limited in extent by time and by the amount of wire and wire personnel available. The minimum essential circuits are installed first and the system expanded as required. Telephone trunk circuits between division signal centers are usually established by radio relay in lieu of wire lines.
- (5) *Radio relay.* Prior to attack, the same restrictions and deception requirements specified for radio communications also apply to radio relay communications. Extensive plans are made, however, and teams deployed, to provide communications support when these restrictions are lifted. Reserve equipments and teams are held well forward in the attack area. Provision is made for helicopter movement of radio relay teams and equipment.

c. Signal Supply. A division signal supply point must be designated from which signal supplies are issued during the attack. Signal supply and maintenance facilities are provided by the signal supply and maintenance section of the signal battalion's headquarters company. In addition, the forward communication company provides field signal maintenance at each forward area signal center.

33. Communication During Reorganization

a. General. When an attack has attained its objective or has been unsuccessful, the division commander must decide to renew the attack, defend, or withdraw. Regardless of the action taken, the signal officer must be prepared to provide signal communication support. As soon as he receives the commander's decision, he directs the signal battalion to modify the existing area communication system to support the new action.

b. Tactical Application of Communication.

- (1) During reorganization, radio communication is altered as little as possible. Any change at this time, especially in the amount and type of message traffic, gives the enemy an opportunity to increase his collection of intelligence.
- (2) Wire systems are installed or changed to meet the new situation.
- (3) The period of reorganization is an excellent time for combat units to replace expendable signal supplies and to repair or exchange signal equipment. For example, wire teams replenish their gasoline and wire supplies. Every effort is made to provide all echelons with the items required for the contemplated operation.

34. Communication During Pursuit

a. General. When an enemy is forced to retreat, an immediate and relentless pursuit may be launched to exploit the advantage. During pursuit, all units are pushed to the extreme limit of physical endurance. Direct pressure against the retreating forces is combined with an encircling force to prevent them from sustaining a successful retrograde action. Maintenance of communication during the pursuit requires maximum effort on the part of all signal troops and maximum use of all available facilities including civilian.

b. Application of Communication. The speed of a vigorous pursuit necessitates rapid and numerous displacements of command posts. Continuous message center operations must be maintained during the pursuit.

- (1) *Messengers.* All available messengers are used at established communication centers. When distances become extended among elements of division headquarters, messenger relay points will have to be established. Aircraft can be used to great advantage to assist the messenger service.
- (2) *Radio communication.* Radio is the most suitable means of communication for pursuing forces. The distance between these forces and the nearest division signal center may become so great that the most powerful radio sets available will be needed to maintain communication.
- (3) *Visual communication.* Direct pressure and encircling forces use panels to identify themselves to friendly aircraft. They may also use panels to communicate with their division air support.

- (4) *Wire communication.* Rapid pursuit does not permit the construction of wire lines. Existing facilities along the routes may be used when practicable.
- (5) *Radio relay.* Use of radio relay during a pursuit is often limited by the speed of the advance. Where possible, radio relay systems will be installed, using the same criteria as applied for use during a march.

c. Signal Supply. The signal officer includes in his plans a provision for the supply of any attached forces used in the pursuit. He arranges to distribute signal supplies to all forces before the pursuit is launched. Every signal plan includes provisions for airdrop or air transport of signal supply, if necessary.

35. Communication During Defense

a. General. The time available to organize a defense position and existing communication facilities determine the elaborateness of signal installations. The organization for defense dictates the type of communication system required. When the mission requires the retention of specific terrain, the commander places primary reliance on the ability of fires and forces deployed on position; with this organization for defense, wire communication is emphasized. A mobile defense is adopted when the commander places primary reliance on maneuver and fire to accomplish defensive mission; with this organization for defense, greater dependence is placed on radio communication and messenger service. For a hastily adopted defense, the communication system currently in use is continued. It is supplemented with speedily constructed wire circuits as needed. When enough time is available, channels of communication are increased and alternate channels are provided.

b. Application of Communication. The division communication system provides communication to division units, to covering forces, to division outposts, and to other units and activities as required. Other units and activities include the division reserve, division air strips, attached troops, supply and evacuation activities, and the echelons of division headquarters.

- (1) *Communication center.* Normally, division signal centers do not move frequently when the division is engaged in defensive operations. Nevertheless, communication center personnel must be prepared to displace at any time. When advance or alternate command posts are established, advance parties are dispatched to start communication installations at new locations.
- (2) *Messengers.* Special messengers are required during

the organization of a defensive position. When the position has become organized, the messenger service normally reverts to scheduled messenger runs.

- (3) *Radio communication.* Radio communication is subordinated to wire communication and messenger service. Radio nets remain operative as a supplement to the wire system.
- (4) *Visual communication.* Visual signals may be used in the defense as in other situations. Their use, however, is attended by the disadvantages of security risk and a possibility of misunderstanding. A panel station is established for very brief messages. Usually, air-to-ground radio communication is less time consuming than panel systems.
- (5) *Wire communication.* The wire system is made as elaborate as time and facilities permit. High priority circuits are established as rapidly as possible to meet immediate requirements. Thereafter, additional circuits are installed to increase traffic capacity and flexibility.
- (6) *Radio relay.* During initial phases of a defensive operation, where security aspects allow, extensive radio relay systems are installed to provide the large circuit capacity required. As the wire system is expanded, radio relay systems are placed on listening silence where possible.

c. *Signal Supply.* A stock of signal supplies is maintained during the defense. All shortages and depleted stocks are replenished as promptly as possible.

36. Communication During Retrograde Movement

a. *General.*

- (1) Retrograde movements including delaying action, withdrawal and retirement. This paragraph discusses communication during disengagement. Communication during a delaying defense is similar except that a series of communication systems may be required for a defense on successive positions. Communication during a retirement is similar to that used during marches and halts.
- (2) Disengagement may be executed either under pressure or not under pressure. Successful disengagement when not under pressure is normally limited to periods of darkness or poor visibility. Disengagement under pressure depends on maneuver, firepower, and control, with the forward units moving to the rear by employing aggressive small unit delaying tactics.

b. *Application of Communication.* Communication operation in the area communication system continues while preparations are made for rearward displacement of the division command post. New installation at the old location is limited to the absolute minimum, while maximum use is made of existing facilities.

- (1) *Radio communication.* Radio operation is regulated during the disengagement. Dummy stations may be used to maintain the normal level of message traffic in the old positions when authorized or required by the corps or army commander. Listening silence may be enforced on the other radio stations, both while withdrawing and on reaching the new locations. Transmissions may be resumed when the operation has been completed.
- (2) *Messengers.* During the disengagement, the need for special messengers is increased. Advance communication centers are established where required and special messengers are assigned to them. Elements of the communication center left at the old command post location may be required to remain after the establishment of the new command post to insure messenger service for the forces remaining in contact with the enemy.
- (3) *Wire communication.* The wire system that is in operation prior to the disengagement is used as required to initiate the retrograde movement. The installation of new wire lines is held to a minimum, both as to number and length. As units disengage, the wire lines not required by them or by the elements left in contact are recovered. All wire lines that cannot be recovered for any reason are made useless by removing random sections.
- (4) *Radio relay.* Use of radio relay during a retrograde movement may be dictated by deception plans and prior practices. Since the intent of the commander during a retrograde movement is to deceive the enemy, radio relay systems must assume the pattern normally employed during the maneuver the commander intends to imitate. Thus, if the commander wishes to convey the thought of a long-term defense, the radio relay systems actually installed must comply with the division's habitual electronic pattern for a defensive situation. Such activities as these may entail loss of radio relay equipments. Radio relay sites to the rear which allow long range control of divisional elements are reconnoitered early, and where the tactical situation permits, equipments are installed prior to the retrograde operation.

37. Communication During Passage of Lines

a. General. To achieve a successful passage of lines or withdrawal from action, close coordination in communication-electronics must be made between the signal officers of the unit making the passage or withdrawal through lines and of the unit being passed through.

b. Application of Communication. Communications of the unit passing through will be limited to the extent possible. Full use will be made by the unit passing through of circuits made available to them from the system of the unit being passed through.

- (1) *Radio.* Radio nets of both units will be operated with the nets of the unit passing through limiting operation to the maximum practicable. Frequencies used during the passage must be carefully coordinated and procedures agreed upon to insure communication between the unit passing through and the unit being passed through.
- (2) *Wire.* Wire communications of the unit passed through will be relatively unaffected. The unit passing through will not establish a wire system during the passage.
- (3) *Messenger.* Messengers for both units will be employed. Those of the unit being passed through will operate on a normal SOP basis. Messengers of the unit passing through will be confined to special messenger service during the pass through.
- (4) *Radio relay.* During passage of lines security becomes an outstanding consideration. Units making the passage of lines will not deploy their radio relay equipment until they have crossed the FEBA. The unit through which the passage is being made will establish radio relay systems in accordance with their normal pattern for radio relay deployment. Units making the passage of lines will be provided control and command circuits through the area system of the unit through which they are passing.

c. Signal Supply. The signal supply system of the unit being passed through will continue normal operations and will be prepared to render emergency assistance to the unit passing through. The signal supply system of the unit passing through will be operating as it would during a march.

38. Communication During a Relief in Place

a. General. Here, as in the passage of lines, close coordination

between the signal officers of the units concerned is absolutely essential to a successful relief in place. During a relief in place, communications-electronics facilities of the relieved unit are taken over by the relieving unit so far as possible. This is particularly true of wire circuits and possibly installed switching facilities. Before the relief, the relieving signal officer coordinates with the unit to be relieved and when practicable, arranges for the signal personnel of the relieving unit to precede the main force into battle positions.

b. Application of Communication. Communications facilities of the unit being relieved will remain in place until an orderly relief is accomplished. All communications normally employed will continue operation until taken over by the relieving unit or the requirement no longer exists. The exchange of TOE equipment will be made only when the urgency of the situation dictates, or by mutual agreement between the signal officers of the commands concerned.

- (1) *Radio.* Radio nets of the unit being relieved will continue operation until a time agreed upon by the signal officers of the units concerned. Consideration should be given, for security purposes, to having the relieved unit continue to operate its normal radio nets for a limited period of time after the relief has been completed. This should be coordinated by the signal officers concerned with the intelligence officers of their respective commands. Radio liaison nets may be established or, frequencies utilized in existing nets will be used to allow liaison officers of the two units to communicate using their organic radio equipment. It may be necessary, due to frequency congestion, for one unit to provide liaison radio sets to the other unit involved in the relief, when the organic equipment of the two units cannot be netted.
- (2) *Wire.* The wire circuits of the relieved unit will be taken over by the relieving unit.
- (3) *Messenger.* Messenger service will be taken over on a jointly established schedule from the relieved unit by the relieving unit.
- (4) *Radio relay.* During relief in place the employment of radio relay by the units involved are guided by the same considerations as for a passage of lines.

c. Signal Supply. Signal supply points operated by the relieved unit will be taken over by the relieving unit at a time agreed upon by the signal officers of the units concerned.

39. Air Landed and Air Mobile Operations

a. Air Landed Operations. The techniques of the airborne division signal battalion are generally applicable to the infantry division signal battalion in the conduct of air landed operations. For details on the techniques of the airborne division signal battalion, refer to FM 11-57 and chapter 5, FM 7-24.

b. Air Mobile Operations. The division signal battalion should cover in its standing operating procedure and planning data for the full use of all types of aircraft, those organic to the division as well as those made available to the division by higher headquarters. SOP and planning data should cover at least the following:

- (1) Requirement for a provisional signal center both airportable and air mobile.
- (2) Weight requirements for planning techniques for crossing obstacles by use of air lift.
- (3) Use of aircraft for laying wire and cable into an air mobile objective.
- (4) Use of airborne radio repeater stations.
- (5) Communications for aviation movement control centers.
- (6) Use of air-mobile signal elements in rear area defense and damage control activities.

CHAPTER 7

COMMAND AND STAFF RELATIONSHIPS

Section I. DIVISION SIGNAL STAFF

40. General

The DSO's staff is provided by TOE 11-6, Headquarters and Headquarters Co., Infantry Division Signal Battalion. The assistant DSO, radio officer, wire officer, and enlisted staff members are organic to the DSO's section, headquarters and headquarters company. In addition to these staff members, the DSO normally appoints a division photographic officer, division signal supply officer, and division signal maintenance officer. These positions are filled by utilizing the officers provided by the supply and maintenance section and the photographic section of headquarters and headquarters company, both as staff officers and operators. Detailed functions of the DSO and his staff members are covered below.

41. Division Signal Officer

To assist the division commander in the communications and electronics functions of command, the signal officer serves as a member of his staff. The DSO advises the commander on communications-electronics matters, pictorial matters, and is responsible for the installation, operation, and maintenance of the command's signal communication system, for electronics and pictorial operations, and for the management of signal supplies and maintenance. The DSO exercises the dual functions of staff and command. These two functions, although vested in a single individual are separate and distinct in that each involves different responsibilities and duties and the exercise of one should not be confused with the exercise of the other.

42. Staff Relationships

a. General. As a member of the division Commander's special staff, the DSO is included in all staff planning actions so that he can present to the commander and the other members of the staff the communications-electronics aspects of projected operations.

b. Coordination. The duties and responsibilities of the DSO cut across the general as well as the special staff. The DSO usually has free access to the Chief of Staff and deals with him on overall communications-electronics matters which affect the command.

c. Functions. There are seven broad functions of a DSO:

- (1) Advice.
- (2) Plans and orders.
- (3) Technical supervision.
- (4) Liaison.
- (5) Training.
- (6) Command.
- (7) Operation of the tactical data processing system.

d. Advice. The DSO advises, informs, and makes recommendations to:

- (1) The commanding general on all communications-electronics matters, including matters involving communications security, electronic warfare, combat surveillance, automatic data processing, signal logistics, signal training, and other matters of signal services available such as pictorial matters to the command; requirements for and the employment of signal troops; use of signal activities for deception; and location of the headquarters or CP's as they affect signal communications.
- (2) All members of the general and special staff on all aspects of signal matters as pertain to their specific areas of responsibility, such as:

(a) *ACofS G1:*

1. Personnel activities with respect to strength, replacements and morale.
2. Movement, organization, operation, internal arrangement, and allocation of space for the headquarters or CP's.
3. Internal message control, courier and messenger service, and other administrative functioning of the headquarters.
4. Communications-electronics activities pertaining to personnel and administration.

(b) *ACofS G2:*

1. Communication and electronic signal intelligence and counterintelligence.
2. Interpretation of captured enemy signal documents.
3. Evaluation of captured enemy signal equipment.
4. Photographic support for intelligence activities.
5. Other special support in signal matters for intelligence operations.

(c) *ACofS G3:*

1. Overall communications-electronics activities pertaining to the tactical mission.
2. Electronic warfare, as pertains to the tactical mission.
3. Organization and signal equipment of units assigned or attached to the division.
4. Training of personnel engaged in signal communication activities.
5. Signal employment in combat operations.
6. Selection of CP's for the headquarters.
7. Physical security for signal installations.
8. Preparation of orders as pertains to signal activities, including paragraph 5 of the division operations order.
9. Preparation of the electronic warfare annex to the division operations order.
10. Priorities for the issue of signal supplies and equipment in critical supply

(d) *ACofS G4:*

1. Procurement, storage, and distribution of signal supplies and equipment.
2. Maintenance and evacuation of signal supplies and equipment.
3. Allocation of critical signal supplies and equipment.
4. Preparation of the signal portion of the division administrative order.
5. Communication-electronics activities pertaining to logistics.

(e) *ACofS G5:* (When civil affairs augmentation to the division is provided, and if not, to the ACofS G3.)

1. Indigenous signal communications facilities.
2. Indigenous labor.
3. Signal communications aspects of treaties.
4. Military use of local civilian communications facilities, supplies and equipment and military support of civilian communications.

(f) *Special Staff.* The DSO must advise all members of the special staff on signal support requirements for their activities.

(3) All units of the command on all signal matters pertaining to:

- (a) Training of communications personnel.
- (b) Communications-electronics security.
- (c) Signal supply.
- (d) Maintenance of signal equipment.
- (e) Inspection of signal equipment.

- (f) Other technical aspects as pertains to signal activities of their unit.

e. Plans and Orders. Every combat operation requires detailed signal planning and coordination in the early planning phases of any operation. To accomplish his planning, coordination, and basic supervision of signal matters, the DSO uses the techniques and orders given below. Subparagraphs (1) through (8) below are recurring for each operation; (9) through (12) below are kept current at all times.

- (1) Signal estimate.
- (2) Signal plan.
- (3) Signal portion, paragraph 4, division operations order.
- (4) Paragraph 5, division operations order.
- (5) Signal annex to division operations order.
- (6) Signal portion of the division administrative order.
- (7) Signal battalion operations order.
- (8) EW Annex to division operations order.
- (9) Division memorandums.
- (10) Standing signal instructions.
- (11) Signal operations instructions.
- (12) Standing operating procedures.

f. Technical Supervision. The DSO also has responsibility for the technical supervision of the following 12 matters:

- (1) Installation, operation, and maintenance of signal communication facilities.
- (2) Assures compliance with established communications security regulations.
- (3) Procurement, storage and distribution of signal supplies to all units of the division.
- (4) Assures proper signal maintenance standards.
- (5) Signal aspects of combat surveillance systems.
- (6) Coordinates with the G2 to insure that all intelligence requirements for signal support are fully complied with.
- (7) Signal aspects of electronic warfare operations.
- (8) Ground and air still and motion picture photographic coverage in support of combat and intelligence operations.
- (9) The division portion of the integrated automatic data processing system.
- (10) Assures proper utilization and maintenance of signal supplies and equipment.

- (11) Prepares the signal portion of the equipment status report.
- (12) Recovery, reclamation, and evacuation of signal equipment, to include captured enemy signal equipment.

g. Liaison. In addition to the liaison and coordination between the DSO and members of the general and special staffs and units of the command, the DSO must also conduct *active continuous* liaison with signal officers of:

- (1) Higher headquarters on matters pertaining to:
 - (a) Technical directives.
 - (b) SOP, (SOI), and (SSI) matters.
 - (c) Routes of signal communications and location of signal centers of the communication systems.
 - (d) Tactical plans and impending operations.
 - (e) Requirements for signal personnel.
 - (f) Signal supply and maintenance activities.
 - (g) Use of indigenous signal communications facilities.
 - (h) Electronic warfare and combat surveillance activities.
 - (i) Technical reports.
- (2) Adjacent headquarters (units and signal officers) on matters pertaining to:
 - (a) Signal support for the operation.
 - (b) Establishment of lateral signal communications.
 - (c) Tactical plans and impending operations.
 - (d) Changes anticipated in current operations.

h. Training. The training function of the DSO includes the responsibility for:

- (1) Assigned signal units.
- (2) Schools for the training of signal communications personnel for units of the command.

i. Data Processing. Operates the tactical data processing system which furnishes data and service concerning:

- (1) Equipment status reports.
- (2) Other data processing services as required.

j. Further details on the staff relationships of the signal officer can be found in FM 101-5, Staff Officers Field Manual Staff Organization and Procedure; FM 100-1, Doctrinal Guidance, and FM 24-150, Electronic Warfare.

43. Assistant Division Signal Officer

The functions of the assistant division signal officer include the following:

- a.* Assists the DSO on planning future communications operations of the division.
- b.* Is responsible for publication of the division SSI and SOI.
- c.* Directs the integration of all signal communications in the division.
- d.* Prepares the signal annex of the division operations order.
- e.* Acts as team chief of the communications-electronics element of the division tactical operations center when a Division Tactical Operations Center (DTOC) is established.
- f.* Is responsible for the efficient operation of the division signal office.
- g.* Acts for the DSO in his absence.

44. Radio Officer

The radio officer will normally work in the division systems control center under the supervision of the battalion S3. The radio officer normally is assigned such functions as:

- a.* Staff supervision over all radio communications established within the division.
- b.* Preparation and dissemination of radio net diagrams of the nets directed or controlled by the division.
- c.* Keeping radiofrequency utilization register and map to assure accurate and up-to-date radiofrequency assignment data.
- d.* Preparation of items of the division SOI and SSI relating to radio matters.
- e.* Preparation and dissemination of the division radio relay systems map overlays.
- f.* Coordinates and plans mission assignment of the frequency utilization section.
- g.* Clearance of radio frequency interference.

45. Wire Officer

The wire officer will normally work in the division systems control center under the supervision of the battalion S3. The wire officer is normally assigned such functions as:

- a.* Establishment of and staff supervision over wire cable installation and maintenance practices to be employed by the units assigned or attached to the division.
- b.* Preparation and dissemination of:
 - (1) Telephone and teletypewriter traffic diagrams used by the division.

- (2) Telephone and teletypewriter directories used by the division.
- (3) Systems and circuit diagrams for the division communication system.
- (4) Line route maps.

c. Conducting communication traffic studies of the load on all types of communication systems used by the division and making recommendations to the communications control officer (signal battalion S3) for the increase or decrease of facilities as required.

d. Compilation of factual and experience data for future reference on communications installations.

e. Preparation of those items of the division SOI and SSI which pertain to wire operations.

46. Signal Supply Officer

a. As a staff officer, the division signal supply officer (DSSO) bears the responsibility for planning, advising, supervising, inspecting, and coordinating on signal supply and maintenance matters, and maintaining liaison with appropriate commanders and staff officers within the division. He will also coordinate supply matters with the army signal supply officer.

b. The DSSO maintains direct supervision over the operation of the division signal supply and maintenance point.

c. He is assisted on maintenance matters by the division signal maintenance officer.

47. Photographic Officer

The photographic officer performs the dual function of staff photographic officer and commander of the photographic section of the headquarters and headquarters company. His duties are as follows:

- a.* Advising the DSO and staff on photographic matters.
- b.* Planning, coordinating, and supervising all photographic activities in the division. This includes but is not limited to:
 - (1) Support of division intelligence operational requirements for photographic coverage.
 - (2) Photographic coverage of division tactical operations.
 - (3) Coordination of the division photographic effort with the staff photographic officer at corps headquarters.
 - (4) Necessary coordination and liaison with the division information officer and the division historical officer.

Section II. SIGNAL BATTALION STAFF

48. General

The battalion headquarters element of the headquarters and headquarters company provides the officer staff that assists the commander in controlling the employment and operation of equipment and personnel of the companies organic to the signal battalion. *Battalion staff officers do not exercise command authority.* They may be authorized to issue orders or directives in the commander's name to subordinate units, when operating within clearly established policies and decisions laid down by the battalion commander. Some of the duties and functions of the battalion commander and his staff are covered below.

49. Battalion Commander

The battalion commander, as previously stated, exercises the dual functions of DSO and signal battalion commander. The battalion commander directs his staff and issues SOP and mission-type orders to the operating companies of the battalion. He exercises control through command channels. Certain technical instructions, such as circuit allocations and changes, frequency assignments and changes, adjustments to the communication system, and similar instructions pertaining to communications-electronics, may, when so delegated by the commander, go directly from the responsible staff activity to operating agencies (signal centers). These instructions are defined as technical control and should be well defined by the battalion commander in SOP. In accomplishing his command function, the battalion commander must concern himself with:

- a. Organization and control.
- b. Personnel strength, morale, discipline, and training.
- c. Administration and housekeeping.
- d. Logistical matters.

50. Executive Officer

The executive officer performs those functions as defined for this office in FM 101-5. So far as regulations permit, he will act for the battalion commander on all battalion matters to afford the commander maximum freedom to devote his attention to his responsibilities as DSO.

51. S1/Adjutant

The S1/adjutant is the administrative chief for the battalion.

He performs those functions as defined for this office in FM 101-5. He normally exercises staff supervision over the battalion personnel section.

52. Battalion S3

The battalion S3 performs those functions as defined for the S2 and S3 in FM 101-5. The S3 is normally delegated authority by the commander to issue directly to operating activities (signal centers) certain technical instructions such as frequency assignment and change, circuit assignment and change, and other adjustment to the communication system. This is called technical control. The technical control authority delegated by the commander must be well defined and should generally be limited as indicated above. All other orders or instructions to the operating units prepared by the S3 must be issued in the name of the battalion commander. The S3 is charged with the establishment and operation of the division systems control center.

53. Battalion S4

The battalion S4 performs those functions as defined in FM 101-5 for this office. (For details on battalion supply operation, see chapter 8).

54. Battalion Motor Officer

The battalion motor officer advises the commander and staff on motor transportation in the battalion and the training of motor transportation personnel. He exercises staff supervision over the battalion motor maintenance section. He coordinates battalion motor movements in arranging road priorities, and other related matters. He must assure, in coordination with the S4, adequate petroleum, oil, and lubricants support for all signal battalion units.

55. Battalion Staff Relationship with Company Commanders

a. The command of headquarters and headquarters company requires a great deal of cooperation and coordination between the unit commander and the battalion staff. It is, therefore, important that the battalion commander in his selection of a headquarters company commander choose the type of leader who can achieve the best possible staff relationship without subordinating the control of his company. A majority of the personnel assigned to headquarters and headquarters company are employed in the staff sections and will be required to spend most of their time with these activities. At the same time, there exist many functions which are the responsibility of the company commander such

as guard, security, and mess detail, which must also be performed by members of the company. Only through realization of the responsibilities of all personnel can the staff and the unit commander operate most efficiently. To preclude denuding the company commander of his authority while retaining responsibility requires the wholehearted cooperation of the battalion staff. In general, the battalion commander should assure that unit command functions are left to the headquarters company commander and that the staff sections involve themselves only with staff operations. The company commander should be kept informed of the status of personnel and equipment assigned to his company and employed by staff or operating sections. He must be kept informed of present and future plans in order that he may render the most effective support both as a unit commander and headquarters commandant for the battalion.

b. The commanding officer of the command operations company has a normal staff relationship with the battalion staff. Orders are received through command channels. Technical channels are used in the manner prescribed by the battalion commander for technical instructions not involving variation from command policies. Technical instructions are issued direct, when necessary, to operating command signal centers by the battalion S3. Since the command signal centers operated by the battalion are provided by the command operation company, this direct contact may bypass normal command channels. It will not, however, prevent the company commander from effectively controlling his unit.

c. The commanding officer of the forward communications company has the same type of relationship with the battalion staff as does the command operations company commander. Here the battalion S3 issues technical instructions direct to the forward signal centers.

Section III. SIGNAL COMMUNICATIONS CONTROL

56. General

a. Signal communications control involves the fitting of signal communications resources to the tactical requirements. One of the functions of the DSO is to adjust the available circuit capacity and facilities to meet the specific requirements of the situation. Since the division area communication system is widely dispersed and constantly subject to change, only through effective control can the communication system be made to offer immediate response to changes in the tactical situation. Control of the division area communication systems is accomplished by establishing a systems

control center at the division main signal center, and subordinate facilities control centers at all other division signal centers.

b. All control centers are delegated authority to make changes in the communication system to respond to the needs of its users. This authority is properly implemented through the promulgation of a sound, understandable, and workable SOP. In addition, control centers must have a current list of priorities for establishing, routing, and rerouting circuits within the signal system. This schedule is established and kept current through constant staff coordination between the DSO and division general and special staff. When a division tactical operations center (DTOC) is established, the DSO, assistant DSO, or designated representative will remain in the communications-electronics element of the DTOC, keeping pace with the tactical situation as it develops and advising the signal communications control center of actions required to respond to the immediate requirements of the tactical situation, and to plan and anticipate future requirements.

57. Division Systems Control Center

The division systems control center is supervised by the signal battalion S3. Engineering, planning, and determination of requirements for the division area communications system are performed by the division signal staff; however, the actual control of the systems and circuits is the responsibility of the division systems control center. This control includes circuit routing assignment, emergency rerouting, and designation of control terminals. It also includes general supervision of signal installation, operation, maintenance and fault location and correction within the system. The systems control center exercises control of the division area communication system through direct signal communication with the division signal centers. The division systems control center requires sole-user circuits to each forward signal center. Detailed information on division signal communication control is found in FM 11-21, which should be used as a reference guide on signal control matters.

CHAPTER 8

BATTALION SUPPORT FUNCTIONS

58. Battalion Mess Operations

The method of providing mess support in the division signal battalion is a matter of command choice and will vary with the unit and the battalion mission. Staff responsibility for coordinating mess operation falls under the S4. The signal battalion has a capability to operate three company size mess facilities. In garrison-type operations, each unit will operate a company mess to support its assigned personnel. In combat operations, the company mess capabilities are used to support selected areas where the largest groups of battalion personnel will be employed. The following types of employment of company mess facilities may be used:

a. Headquarters and headquarters company responsible for establishing and operating a mess at the battalion CP. This mess may be augmented by the command operations company mess section to support the battalion headquarters, division signal section, and all signal battalion personnel operating in or near the division main signal center.

b. Command operations company responsible for establishing and operating a company mess facility at the division advance signal center to provide mess support to all signal battalion personnel located in the vicinity.

c. The forward communications company, depending upon the situation, will either augment the command operations company mess at division advance, supporting as many of its personnel from this point as practicable, or establish a separate mess facility at a point which will afford a better capability for messing a majority of the personnel assigned.

d. Since the mess capability of the signal battalion is not large enough to support a mess facility at each location where battalion personnel will be operating, it will be necessary for signal battalion personnel employed at division rear, trains, brigade and the battle groups to ration with the unit providing mess support for these echelons of the command.

e. Because of the limited number of cooks assigned to the com-

panies of the signal battalion, it will not normally be practicable to augment a unit providing for mess supporting signal battalion personnel with cooks from the signal battalion.

59. Battalion Supply Operations

Battalion supply operations are governed by the provisions of AR 735-35. Supply operations are under the staff supervision of the battalion S4. The battalion supply operation is conducted on the basis that a minimum of supplies will be held in the battalion and that rations and water will be delivered directly to the using elements. The organization of the battalion supply system also takes into account that all company elements will be refueled directly by mobile filling stations, operated by the division quartermaster company. It is expected that the battalion supply section will make supply runs to requiring battalion elements consistent with the requirements and the supply sections' capability to provide this service.

60. Battalion Motor Maintenance Operations

Battalion motor maintenance operations come under the general supervision of the battalion motor officer and under the direct supervision of the battalion motor maintenance officer. Motor and generator maintenance is performed on site insofar as practicable. The battalion motor maintenance section of headquarters and headquarters company provide tool sets, a wrecker, and a maintenance shelter for the establishment of a battalion motor repair facility. The battalion maintenance operation is confined to organizational maintenance on motor vehicles and power generators supplemental to the capability of the battalion's organic companies.

61. Battalion Command Post

The battalion CP will normally be located in the vicinity of the division main CP. Selecting the CP is a responsibility of the commanding officer of the headquarters and headquarters company, subject to approval of the selected location by the battalion commander. The battalion CP will displace in one echelon on orders of the battalion commander. In addition to selecting the location for the battalion CP, the headquarters and headquarters company commander is normally assigned the duties and functions of headquarters commandant for the battalion.

APPENDIX REFERENCES

1. General

This appendix lists numbers and titles of publications pertinent to the operations of the infantry division, signal battalion. For availability of items listed and publications on additional subjects, refer to DA Pamphlets in the 310-series.

2. Administration

AR 220-60	Battalions, Battle Groups, Squadrons: General Provisions.
AR 220-70	Companies: General Provisions.
AR 230-5	Nonappropriated Funds and Related Activities. General Policies.
AR 320-5	Dictionary of United States Army Terms
AR 320-50	Authorized Abbreviations and Brevity Codes.
AR 340-15	Correspondence
AR 380-5	Safeguarding Defense Information
FM 100-10	Field Service Regulations; Administration.
FM 101-5	Staff Officer's Field Manual: Staff Organization and Procedure.
FM 101-10	Staff Officer's Field Manual: Organization, Technical and Logistical Data.
TOE 11-5()	Infantry Division Signal Battalion

3. Operations

FM 7-24	Communication in Infantry and Airborne Divisions.
FM 7-100	Infantry Division
FM 11-8	Field Radio Relay Techniques
FM 11-16	Signal Orders, Records and Reports
FM 11-21	Tactical Signal Communications Systems, Division, Corps and Army (when published).
FM 11-40	Signal Corps Pictorial Operations
FM 11-57	Signal Battalion, Airborne Division
FM 17-70	Communication for Armor Units

FM 24-18	Field Radio Techniques
FM 24-20	Field Wire and Field Cable Techniques
FM 24-150	Electronic Warfare
FM 30-5	Combat Intelligence
FM 30-16	Technical Intelligence (U)
FM 31-21	Guerilla Warfare and Special Forces Operations.
FM 31-25	Desert Operations
FM 31-71	Northern Operations
FM 41-10	Civil Affairs Operations
FM 72-20	Jungle Operations
FM 100-1	Doctrinal Guidance
FM 100-5	Field Service Regulations; Operations
FM 100-11	Signal Communications Doctrine
FM 101-5	Staff Officers Field Manual Staff Organization and Procedure.
AR 380-40	Safeguarding Cryptomatter
AR 380-41	Control of Cryptomaterial

4. Training

ATT 11-5	Signal Battalion (Infantry Division) TOE 11-5.
FM 21-5	Military Training
FM 21-6	Techniques of Military Instruction
FM 21-30	Military Symbols

5. Supply and Maintenance

AR 711-16	Installation Stock Control and Supply Procedures.
AR 735-2	Transfer of Property Accountability and Responsibility.
AR 735-4	Expendable Property
AR 735-5	Property Accountability: General Principles and Policies.
AR 735-11	Accounting for Lost, Damaged, and Destroyed Property.
AR 735-35	Property Accountability: Supply Procedures for TOE Units, Organizations and Non-TOE Activities.
AR 750-5	Maintenance Responsibilities and Shop Operation.
AR 750-8	Command Maintenance Inspections
AR 750-610	Communications Security Equipment Maintenance.

AR 750-625	Maintenance Inspections and Reports; Signal Equipment.
DA Pam 310-21	Military Publications: Index of Supply Manuals; Signal Corps.
SB 11-100	Serviceability Standards for Signal Equipment in Hands of Troops.

6. Fortifications, Camouflage, and Demolition

FM 5-15	Field Fortifications
FM 5-20	Camouflage, Basic Principles and Field Camouflage.
FM 5-25	Explosives and Demolitions

7. Miscellaneous

DA Pam 108-1	Index of Army Motion Pictures, Film Strips, Slides, and Phono Recordings.
DA Pam 310-1	Military Publications: Index of Administrative Publications (Army Regulations, Special Regulations, Department of the Army Pamphlets, Commercial Traffic Bulletins, Military Traffic Management Bulletins, General Orders, Bulletins, and Circulars).
DA Pam 310-2	Military Publications: Index of Blank Forms.
DA Pam 310-3	Military Publications: Index of Training Publications (Field Manuals, Reserve Officers' Training Corps Manuals, Training Circulars, Army Training Programs, Army Subject Schedules, Army Training Tests, War Department and Department of the Army Posters, and Firing Tables and Trajectory Charts).
DA Pam 310-4	Military Publications: Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA Pam 310-5	Military Publications: Index of Graphic Training Aids and Devices.
DA Pam 310-7	Military Publications: Index of Tables of Organization and Equipment, Tables of Organization, Type Tables of Distribution, and Tables of Allowances.

[AG 322 (17 Mar 61)]

BY ORDER OF THE SECRETARY OF THE ARMY:

G. H. DECKER,
General, United States Army,
Chief of Staff.

Official:

R. V. LEE,
Major General, United States Army,
The Adjutant General.

Distribution:

Active Army:

To be distributed in accordance with DA Form 12-7 requirements for
TM 11-series (Unclass) plus the following:

CNGB (150)	PMGS (150)
Tech Stf, DA (2) except	USARADSCH (10)
CSigO (10)	USATSCH (10)
MDW (1)	USAARMS (50)
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Div (2) except	USAAMS (250)
Inf Div (30)	USA Sig Tng Cen (90)
Bde (2)	USAINTC (10)
USACGSC (50)	Units org under fol TOE:
USASCS (3000)	11-5 (25)
USASRDL (10)	

NG: State AG (3). Units org under fol TOE: 6-100, 7-1, 11-5 (3); 11-6,
11-7, 11-8 (1).

USAR: Same as Active Army except allowance is one copy to each unit.
For explanation of abbreviations used, see AR 320-50.

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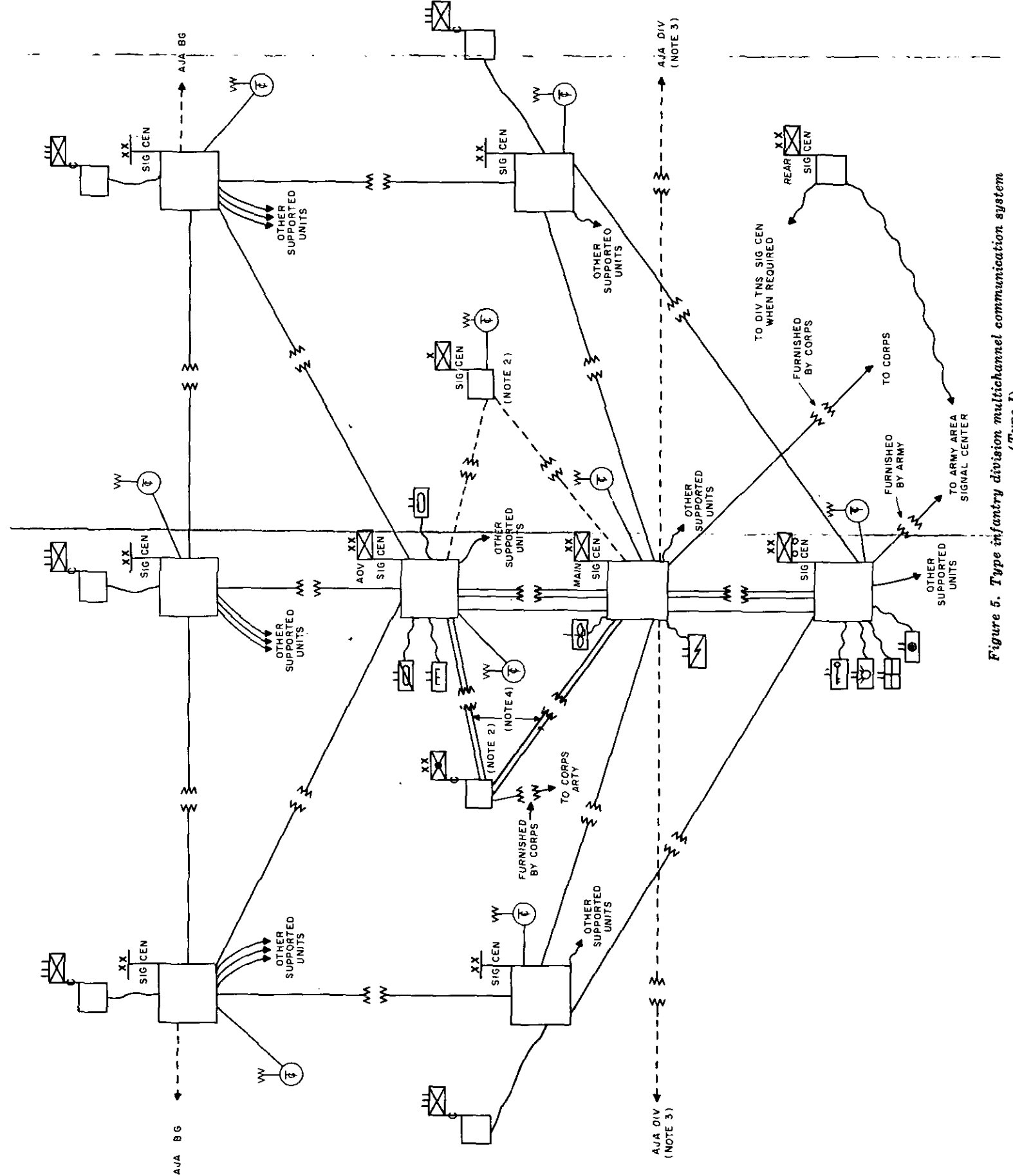


Figure 5. Type I infantry division multichannel communication system (Type I).

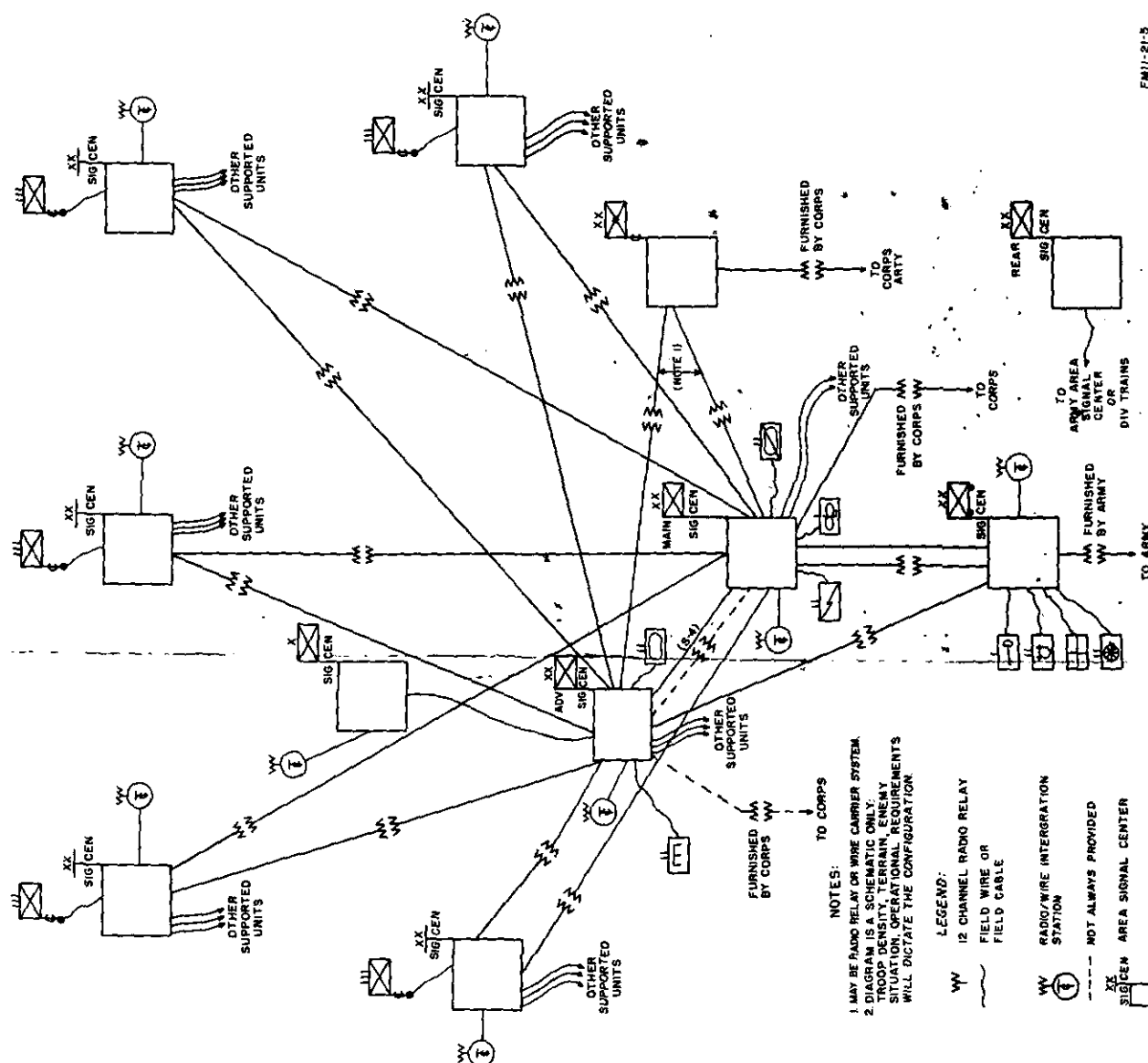


Figure 6. Type infantry division multichannel communication system (Type II).

UNITS	ARMY AIR ROST RATT	ARMY LOG RATT	CORPS CMD #1 RATT	DIVISION CMD/OP RATT	DIVISION INTELL RATT	DIV CG CMD FM	DIVISION ADM/LOG RATT	DIVISION AIR ROST AM-CW-VOICE	DIV WARNING AM VOICE
DIVISION ADVANCE SIGNAL CENTER				AN/GRC-46 (S)	AN/GRC-46 (S)	AN/VRO-3 (S)			AN/GRR-5 (1B S)
DIVISION MAIN		AN/GRC-26 (S)	AN/GRC-26 (S)	AN/GRC-26 (S)	AN/GRC-46 (S)	AN/VRC-3 (S)	AN/GRC-46 (S)		AN/GRC-19 (S)
DIVISION REAR							AN/GRC-28 (S)		AN/GRR-5 (3B S)
DIVISION FSOC	AN/VRC-24 (S)							AN/GRR-5 (3B S)	
BRIGADE				AN/GRC-46 (S)		AN/VRO-3 (S)			AN/GRR-5 (3B S)
DIVISION ARTY				AN/GRC-46 (S)	AN/GRC-46 (S)	AN/VRC-10 (S)	AN/GRC-46 (2)		AN/GRC-19 (S)
BATTLE GROUP (S)				AN/GRC-46 (S)	AN/GRC-46 (S)	AN/VRC-3 (S)	AN/GRC-46 (2)	AN/GRC-19 (S)	AN/GRR-5 (1)
ARMOR BN				AN/VRC-29 (S)		AN/VRC-3 (S)	AN/GRC-29 (S)	AN/GRR-5 (1)	AN/GRR-5 (1)
CAV SQDN				AN/VRC-29 (S)	AN/VRC-29 (S)	AN/VRC-3 (S)	AN/GRC-29 (S)	AN/GRC-19 (S)	AN/GRR-5 (1)
AVN CO				AN/GRC-46 (2)	AN/GRC-46 (S)	AN/VRC-10 (S)	AN/GRC-46 (4)		AN/GRR-5 (3)
DIV TRAINS		AN/GRC-26 (5B S)		AN/GRC-46 (2B S)		AN/VRC-18 (S)	AN/GRC-46 (S)		AN/GRR-5 (3B S)
ENG BN				AN/GRC-46 (S)		AN/VRC-10 (S)	AN/GRC-46 (2)		AN/GRR-5 (3)
ORD BN						AN/VRC-18 (S)	AN/GRC-46 (S)		AN/GRR-5 (3)
MED BN						AN/VRC-18 (S)	AN/GRC-46 (S)		AN/GRR-5 (3)
TRANS BN						AN/VRC-10 (S)	AN/GRC-46 (S)		AN/GRR-5 (3)
QM CO						AN/VRC-10 (S)	AN/GRC-46 (S)		AN/GRR-5 (3)

LEGEND:

(1) MONITORS NET WITH AN/GRR-5 RECEIVER, ENTERS NET BY SWITCHING RADIO SET FROM ANOTHER NET.

(2) ENTERS NET AS REQUIRED BY SWITCHING SET FROM ANOTHER NET.

(3) MONITORS ONLY.

(4) ENTERS NET AS REQUIRED BY SWITCHING FROM DIV COND OP NET.

(5) WHEN ARMY LOGISTICAL NET TERMINATES AT DIVISION TRAINS.

(S) PERSONNEL AND EQUIPMENT FURNISHED BY DIV SIGNAL BN.

FMI-10-7

Figure 8. Typical infantry division radio nets.